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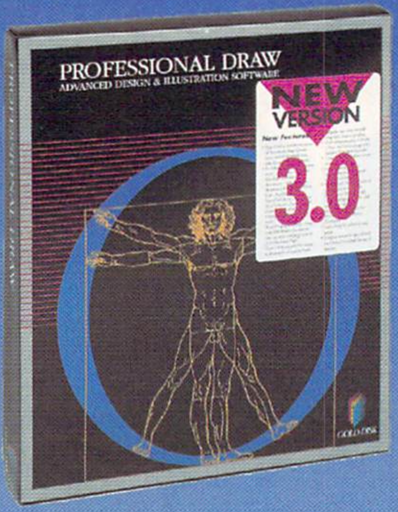


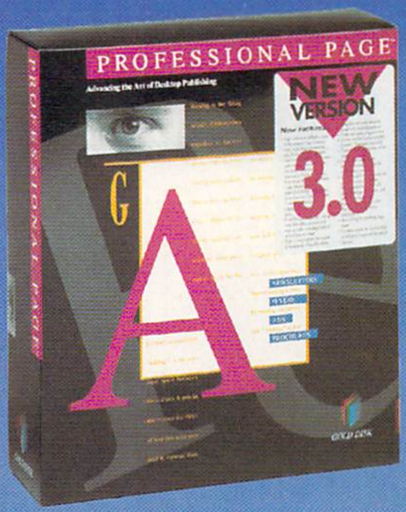
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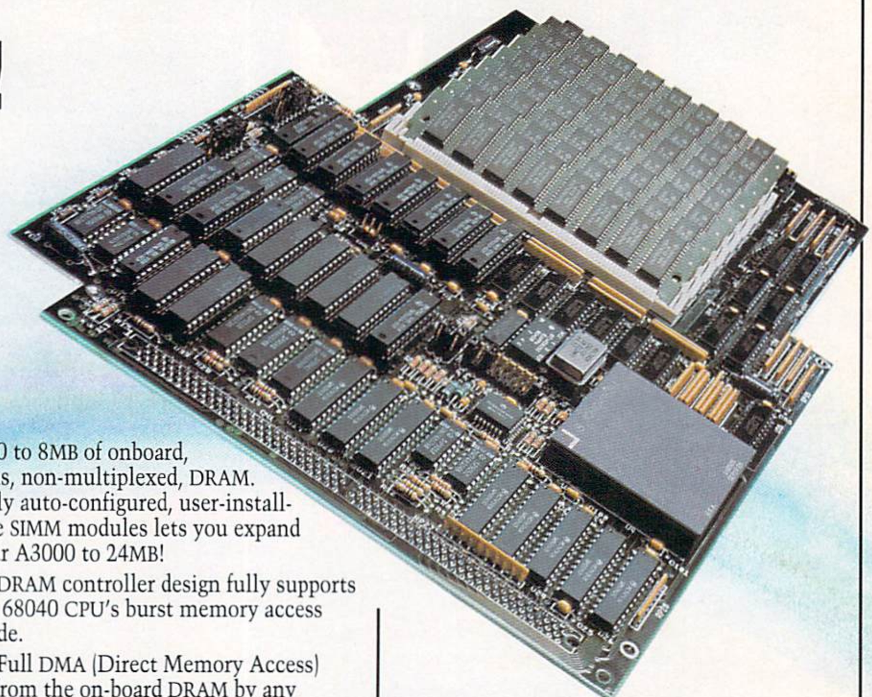
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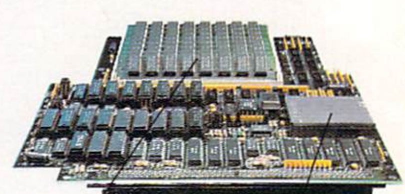
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CHIEF CONCERNS

Commodore is taking aggressive new steps

to pitch its image to the public.

TODAY I GOT a handwritten letter from Joe Riviera. At least I think it said Riviera, but with bad handwriting you can't always tell. After buttering me up with praise for the magazine, Joe got down to business.

Like thousands of our readers, Joe wants to hear about the future of the Amiga so he can decide whether to dump more money into his machine. Without answers to these questions, Joe feels lost. He's in good company.

I agree that there is a certain silence that is nerve-racking. We hear Apple this, IBM that, and Amiga nothing. Well, I've been doing a little digging, and have come up with a few nuggets you might find encouraging. For a quiet company, Commodore's been plenty busy.

First off, Commodore has just hired a gent named David Pleasance to head up consumer sales. Pleasance was most recently general manager for the Swiss-based Commodore Electronics Limited, and he ran operations in 27 countries, including the exploding (in terms of Commodore sales) Eastern Bloc. He has also been credited with helping build the UK market, which is thriving more than any.

Here is his plan: Commodore will try to do here what it has done so well overseas, which is to generate excitement for the low end of the line. We will see bundles featuring hot unreleased games, aggressive pricing, and, we hope, good distribution.

Although I've heard many complaints about the Amiga being a game machine, I can't remember it ever being marketed that way. If we already have that stigma, we might as well benefit from it. Besides, I don't think that game sales are bad at all. Apple is getting into mass merchandisers, and the most popular computer game platform today is MS-DOS!

Pleasance also pledges a new face for Commodore. He plans to revive relationships with user's groups and to have an open, more accessible approach with the press and developers.

There's plenty going on in the high end, as well. Commodore's Dave Archambault has spearheaded a new print ad campaign, one that should have been done years ago. If you read *InfoWorld*, *PC Week*, or any of the other high-powered PC trade books, you've probably seen it. The idea is to sell Amigas to corporations for desktop video and multimedia. Unlike past campaigns, I think this one has legs.

Ads, bundles, and good relations are fine, but what you really want are new and better Amigas. On this front, I can assure you, engineering is honking. We can't give out details, but new systems will be coming out that push the Amiga forward in every way.

Best of all, Amiga developers remain committed to bringing out the most innovative and cost-effective products in any market. And finally, there are now over three million Amigas worldwide.

You know, it's funny. What makes the Amiga so great is simple. A small, tight, multitasking operating system, custom chips to make graphics, video, and animation fly, and video compatibility. That's it. As easy as it sounds, no one in either the Mac or PC market has been able to duplicate any of these feats.

And I've heard of nothing in development that will change that. It's almost as if there is a conspiracy between Intel, the clone makers, and Microsoft to maintain the demand for faster CPUs. You see, if the PC had custom chips like the Amiga, you wouldn't need those expensive Intel 486s, 586s, and what not.

If you're looking for the most awesome spreadsheets and databases money can buy, then the Amiga really has little to recommend it. And clearly Amiga development efforts are not moving in that direction. But look at our last few review sections. Extraordinary new graphics and animation products are launched every month.

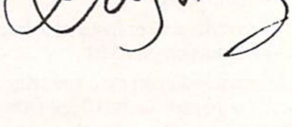
Not a Pretty Sight

I've seen plenty of computer markets die. I watched Tandy's TRS-DOS systems thrash for years before keeling under. I was mesmerized by the full spectacle of the Osborne as it suffocated under the weight of an IBM-compatible Compaq portable. And I watched with glee as the DEC Rainbow whimpered its last Abort, Retry, or Ignore.

What each of these systems had in common was obsolescence. Don't get me wrong. PCs and Macs are growing up. But they are still not better than the Amiga. If they were, the Amiga would have kicked the bucket long ago.

So what does all this say about the future? We are not going to knock off the Mac and PC in the area of general-purpose computing. Dull computers serve those needs just fine. Nor will we seriously dent the game sales of Sega and Nintendo to prepubescents across the nation.

But we are going to see new Amigas, tons of great third-party stuff, and perhaps a new resolve on the part of Commodore. As The Talking Heads once sang about the Amiga: "This ain't no party, this ain't no disco, this ain't no C-64!" ■





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It's no wonder we say the G-FORCE 030 Combo is the *Must Have* Add-on for your A2000.

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OVERSCAN

News, New Products and Networks

An Amiga For the Teacher

PHOENIX, ARIZONA—While Apple computers may be as common in American classrooms as dandelions in the spring, many teachers attending the 32nd annual National Art Education Association (NAEA) convention May 1–5 became eager to add Amigas to their schools. Hundreds of teachers and administrators visited an exhibit produced by Curt Kass/Ontological Survey and cosponsored by Commodore, Sharp Electronics, Digital Creations, Electronic Arts, Great Valley Products, and NewTek.

There, teachers were able to watch two professional Amiga artists use DCTV for watercolor effects and DeluxePaint for painting and animation—and then try their own hands at the mouse. Attendees also got to see NewTek's Video Toaster, a laser-disk player, a Sharp large-screen projector showing AmigaVision, and a GVP-accelerated workstation.

"I am very impressed," said Kay Hansen, an art teacher from the Neenah (Wisconsin) public schools. Like many trained in traditional art media, Hansen expressed trepidation about learning to use a computer, but stated that "it looks very easy."



Tony Kashinn (right) discusses color theory and computer fine art with Dr. Richard A. Ciganko, of Ohio State University's Lima campus.

Tools and Training

Educator Curt Kass orchestrated the exhibit through his connections with the NAEA and Commodore. Kass has been working with Commodore for nearly two years, researching the Amiga's application to art education. Kass has led several workshops exploring how children learn art skills using the computer alongside traditional art media. He and Dr. David Baker, past president of the NAEA, and Dr. Joe Reis, former multimedia producer for the National Gallery in Washington, DC, produced a video of Kass's "College for Kids" last summer, to which Commodore loaned 18 A3000 workstations.

Kass looks forward to Commodore's continued support, which he said is unique. Commodore is helping to educate teachers "so that they're empowered with knowledge, as opposed to just dumping technology into the schools and then letting kids get ahead of the teachers," says Kass.

Art teachers found the Amiga well suited for pure artistic freedom. So does artist Anthony Kashinn, who will have two Amiga-generated paintings in the seventh edition of the *Encyclopedia of Living Artists in America* (Art Network, 1992). After demonstrating watercolor-like painting to "several hard-core Macintosh users," Kashinn got "concessions that an Amiga equipped with DCTV could do things their Macs could not." The Mac is a "memory hog and has very few keyboard commands, which bogs down the creative process," he said, and noted that several Mac users came back to request a second demonstration.

Teacher Herb Eveland, from Plymouth (Indiana) High School, plans to add Amigas to the school's computer-graphics lab, which now contains a dozen Apple and Mac workstations. "I think we need to expand the students' experience with a lot of different computers," he said.

Response to the exhibit has been excellent, said Kass, who has already been invited to give presentations to next year's convention in Chicago and to several regional conventions later this year. Educators are receptive "because they're seeing that there's some curricular background to all of this," he said.

—Laurel A. Kashinn

Sell or Buy

You won't find many deals on new and used Amiga-related products in the classified ads of your daily newspaper, but you will on NAEX, the **National Amiga Exchange**. NAEX is a free electronic classified-ad listing that is updated continuously and available instantly to anyone in the world by fax. To get a copy, dial 703/620-9499 from your fax machine, then press the button(s) that set your machine to receive a fax message. (The button is labelled Poll on many fax machines, and the feature is not provided on some computer-based fax systems; consult your manual for specifics on your unit.)

Want to sell instead of buy? An advertising form is supplied with the listing, and NAEX charges 10% of your asking price (minimum $3; maximum $25). For more information, contact ***DC Computer Repair***. (RS# 102.)

Commodore Says...

The word from Commodore concerning its A570 CD-ROM drive for the A500, which we hailed in our June issue (see "O Say Can You CD," p. 24), is that the unit is awaiting FCC approval. No release date has been scheduled, nor a price set, but we'll keep you posted.

More solid news is Commodore's recent appointment of David Pleasance to ►

To locate the vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 106.

the post of Vice President of Consumer Sales for the US. Until recently general manager of Commodore Electronics Limited in Switzerland, Pleasance plans to "strengthen relationships with the retail distribution channel, software developers, and the current base of Commodore home-computer owners."



OVERHEARD

C programmers, the Amiga C Club (ACC) wants *you*! With members in 37 countries, the two-year-old club continually updates its Amiga C Encyclopedia, which contains shareware and ACCware that members are authorized to use in their own programs. Membership ($60) includes the encyclopedia, plus assistance and advice when you need it. For more information, contact Datra, Amiga C Club, Anders Bjerin, Tulevagen 22, 181 41 Lidingo, Sweden.

Run, REXX, Run!

Want to run faster? The **REXX Plus Compiler** (***Dineen Edwards Group***, $150) goes where Keds fear to tread. REXX Plus promises to make your ARexx programs run two to fifteen times faster. The programs it compiles are fully reentrant; you can even make them resident so that ARexx macros can execute as part of the host program. For a $10 yearly license, you can distribute your compiled code as a commercial or freely distributable product.

The compiler generates 68000 assembler object code in a BLINK-compatible format, which C and other compatible languages can call. Execution of compiled programs requires the interpreter plus 32K (for the rexxplslib.library and the controlling task), in addition to the RAM needed by the executable.

REXX Plus's error messages provide line numbers and often a column number. It comes with a more than 270-page manual, works best with 1MB of RAM, and runs under both 1.3 and 2.0. (RS# 101.)

Just Say Know

Are they games? Are they tutors? Yes! A group of new programs promise to provide not only knowledge, but fun.

Parth Galen's **PhunnyPhonemes** ($33) targets 6–11 year-olds and requires no initial reading skill. In a set of spelling exercises grouped by phonetic content, animated characters deliver 16 lessons, and more than 100 spelling "tests" challenge you to build walls at an outer-space construction site by arranging letter tiles. The program comes on two noncopy-protected disks and requires 1MB of RAM and a single floppy drive. The 80-page manual reviews phonetics and documents the six utilities that accompany the main program. (RS# 103.)

Mathasaurs (***CanCor***, $24.95) teaches ►



ON-LINE SCAN

By Tim Walsh

No polls need be taken to reveal that telecommunication networks can play a significant role in either finding new hobbies or making valuable contacts in present ones. While nearly every net has an area called Hobby, it is typically reserved for research-type activities such as genealogy and creative or workshop hobbies. An example is CompuServe's Woodworking section, which was mentioned in the February '92 issue of *Fine WoodWorking* magazine.

These, however, are just some of literally thousands of hobbies covered on the nets. Some "hobbies" may not be perceived as such; most folks don't consider cooking a hobby, they just like to create culinary delights. Regardless, BIX serves up a Food forum, CompuServe answers your craving with a Food/Wine forum, Portal has a Special Interest Group (SIG) devoted to Cooking and Recipes, and GEnie offers a Food and Wine RoundTable.

If you get a high out of flying, check out the Aviation areas on BIX, GEnie and CompuServe. And you can find video, music, graphics, and writing forums throughout the nets. Programming is also accommodated as a hobby on every network; budding programmers readily swap routines and reference materials with real-time spontaneity, and the nets serve as a gathering place to share ideas.

Reining in the Sing

Music has been around longer than computers, and many computerists have more than just a passing interest in it. Whether you enjoy music as a musician, an aficionado, or an audiophile, you can discover others who share your interest throughout all the nets, both within and outside of music forums.

Within the Extended Hobbies/Lifestyles/Education area on CompuServe is an Arts/Music/Literature area packed with music news and files. GEnie's answer to music is found in MIDI/WorldMusic RoundTable, and BIX's Entertainment and Leisure Exchange offers an area simply called Music.

Unlike CompuServe and GEnie's timely, wire-fed resources of mass information updates on the music world, BIX's Music area and Portal's Audiophile SIG serve as friendly, note-swapping forums for personal music discussions. Your ability quickly to recall all of Gilbert O'Sullivan's and Karen Carpenter's Top-40 hits from the early '70s probably won't put any groceries on the table, but it might give you revered standing in certain circles.

Sports Bars

Whether the "Life's short, play hard" drill of television advertising or our unrelenting pursuit of happiness is to blame, many of us are inflicted with a consuming desire to engage in sports with an intensity that borders on pure fanaticism. When it comes to talking big about sports, the nets are the place to be: Talk comes from bench warmers, jocks eager to flaunt their athletic prowess, and everyone in between. Trivia buffs talk stats and match wits in recalling historic events.

CompuServe's Outdoor forum is a sports participant's dream come true, with events ranging from firearms to cycling. GEnie offers a long list of various sports and upcoming activities in its expansive Leisure Pursuits & Hobbies area. BIX offers an Entertainment and Leisure area that contains libraries, messages, and discussions on sports and other activities, and its Outdoors conference covers such activities as camping and angling.

Portal contains expansive Usenet Archives, Clarinet, and Internet services (still being tested at this writing) that can take you days to browse through for activities and events to fill your leisure time.

When a little R & R is in order, here's how to contact the nets:

BIX
General Videotext Corp.
1030 Massachusetts Ave.
Cambridge, MA 02138
800/227-2983
617/354-4137

CompuServe
PO Box 20212
5000 Arlington Center Blvd.
Columbus, OH 43220
614/457-0802
800/848-8199

GEnie
401 North Washington St.
Rockville, MD 20850
800/638-9636

Portal Communications Company
20863 Stevens Creek Blvd.
Suite 200
Cupertino, CA 95014
408/973-9111 □

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▶ **Record** sound samples from any source, including voices, noise, and pre-recorded instruments, to create your own instruments and effects.

▶ **Edit** sounds quickly in real time. Add effects like reverb and echo, run sounds backward, alter wave forms, cut and paste sound segments, create loops, eliminate pops and scratches.

▶ **Compose** easily using the DSS 4-track sequencer and your Amiga or MIDI keyboard. Draw from up to 31 instruments at a time, in up to four octaves with 8 different variable effects. Mix and modify sounds in real time as you compose, through direct interface with the sound editor.

DSS Stretches the outer limits of 8-bit sound

- Create your own 4-track, self-playing musical compositions.
- Make soundtracks for home video, animation or visual presentations complete with voice-over, sound effects and music.
- Analyze voice patterns and stereo separation.
- Analyze graphic equalization of real-time sound.
- Remove "pops" from old phonograph recordings.
- Create custom instruments and sound effects by collecting and/or modifying pre-recorded instruments, voice, or sounds from any source, and use them in your own compositions.
- Save your sound and music to disk or send it out via modem for replay on any Amiga.

Check out these unparalleled features

✓ AmigaDOS 2.0 compatible; written in assembly language.

✓ Multi-tasking operation.

✓ 68020 and 68030 compatible.

✓ Comprehensive tutorial manual helps even beginners get started right away.

✓ Intuition-based graphic interface makes operation easy.

✓ MIDI-in capability.

✓ Direct interface between sequencer and editor.

✓ Hold 31 sound samples in memory at once – all shown on screen so they are easy to manipulate.

✓ Effects and processing capabilities include echo, mix, filter, re-sample, sound data inversion, playing sounds backwards, loops, fade-in/fade-out and more.

✓ Manipulate sound samples in real time, as you listen.

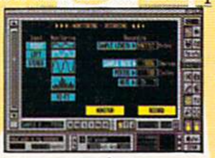
✓ Create sampled instruments with 1, 3 and 5 octaves.

✓ HIFI recording for highest quality playback.

✓ Controls for faster/slower playback and filtering high frequencies during playback.

✓ Load and save samples, songs and instruments in multiple formats.

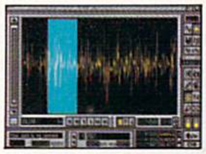




✓ Multiple effects for each note.

✓ Stereo and monophonic operation. Also convert mono to stereo or separate stereo.

✓ Auto-playing music modules.





✓ Real-time oscilloscope and spectrum analysis.

✓ Real-time reverberation.

✓ Graphic editing of wave forms through easy-to-use functions, including zoom in/out and precision controls for position, frequency and amplitude.

✓ Draw sound waves freehand using the mouse.

✓ Direct editing of individual sample numeric values.

✓ Maximum recording speed of 51,000 samples/second (38,908 samples/second in stereo).

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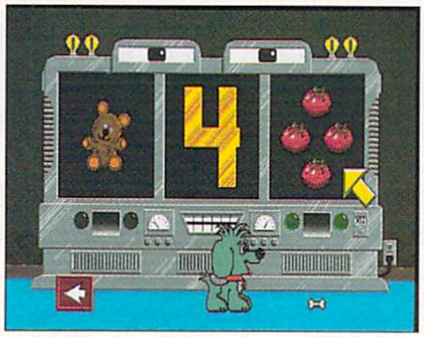
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simple, one-digit equations in flash-card style to kids of preschool or elementary age. The kids' objective is to rescue the Babysaurs, and one or two can play. Accompanying the characters on screen are digitized voices and sounds. (RS# 104.)

FlashBlaster (*EasyScript*, $49.95), designed for ages 5–12, takes an arcade-game approach, combining digitized sound with a variety of animation effects. Children are rewarded for a good job by being inducted into one of FlashBlaster's halls of fame. The program requires 1MB RAM and works with either 1.3 or 2.0 AmigaDOS. (RS# 105.)

For those just learning to count (ages 2–6), ***Devasoft*** introduces **Amy's Fun-2-3 Adventure** ($49.95), the first in a planned series of instructional programs that will feature a puppy called Amy. In Fun-2-3, Amy guides youngsters through a variety of activities that employ game-like design, detailed animation, music, and digitized speech to reinforce learning. The noncopy-protected program is hard-drive installable, 2.0 compatible, and requires no typing, so children can run it by themselves. (RS# 106.)



Amy's Fun-2-3 Adventure introduces numbers to preschoolers.

Mark's MathLab (*EasyScript*, $49.95) targets a more advanced audience: high-school level and beyond. In addition to providing experimental fun, this numeric-computation program can demonstrate function behavior in two or three dimensions, assist engineering design and analysis, and more. The program plots functions containing variables, allows 75 tokens and quads and 30 constants per expression, and provides requesters—capable of holding up to 150 or 225 characters—with default values for novices. MathLab's parser also recognizes 34 built-in math functions. You can view the graph you create from any rotational position, and then save it as an IFF file. The program runs with 1.3 or 2.0, and requires 1MB RAM. (RS# 107.)

Having trouble choosing educational software? *Pride's Guide to Educational Software* (***Crossway Books***, $25) rates over 750 programs for preschoolers to adults on Amiga, PC, Mac, and Apple platforms. The book aims to teach you everything you need to know about educational computing, even if you're a novice. It includes an introduction to multimedia, five computer-term glossaries, a beginners' guide to hardware, and a suppliers' index. (RS# 108.)

New Math

Whether you use **MathVISION** (***Seven Seas Software***, $197) for artistic or mathematical work may determine which of the four library disks you choose. To get one for free, you must either purchase MathVISION or introduce it to an eventual purchaser. MathVISION lets you enter and edit equations and recursive routines, and it displays in full-color graphs the mathematical constructs resulting from their execution.

The library disks contain sample formulas, pictures, and hooks that allow you to use the program for special purposes. The disks—entitled Secrets of an Artist, Animation and 3-D, Mandlebrot Variations, and Complex and Polar Arithmetic Library—normally retail for $49-$79. (RS# 109.)

Toast Masters

Toast and Coffee. It's not just for breakfast anymore. Now it's a "user's group on video" for owners of NewTek's Video Toaster. The bimonthly video (produced by ***Videographix***, $48 per year) promises to give you tips, techniques, product demonstrations, and a showcase for subscriber-submitted material. (RS# 110.)

Veteran video-engineering firm ***Cardinal Video*** enters the Amiga market with **Breadboard** ($398), a video-delay and buffer board for use with the Toaster. The board fits in one of your A2000's PC slots and permits downstream keying of Toaster signals with other effects equipment.

The BreadBoard's five video amplifiers provide adjustments for unity gain. Three of these have delay lines, which you can set for delays of near 0 to 500 nanoseconds. You can strap the delay channels to the Toaster's inputs 1 to 4, to the key-insert signal, and to the alpha channel that provides a key-source signal. The remaining amps provide additional program and preview outputs. (RS# 111.)

Who says you must learn ARexx to automate the Toaster's switcher software? ***The Byte Factory***'s **Toaster Sequence Editor** ($75) lets you control all ARexx-accessible Toaster functions through script files that you create in its point-and-click environment. In fact, the Editor does not require ARexx in order to work (although you can save the scripts as ARexx programs).

In addition to setting inputs, performing transitions, and loading and saving frames, you can create functions—including variable-speed effects—that are unavailable through the Toaster's standard interface.

The Toaster Sequence Editor works with Toaster versions 1 and 2 and AmigaDOS versions 1.3 and 2.0. If you'd also like to rearrange effects, change default speeds, and add or delete new effects to or from a project file, watch for **The Toaster Project Editor**, coming soon from The Byte Factory. (RS# 112.)

Music, Man

If you can't adjust the tunes that come out of your boom box, then you don't have the right kind. ***Dr. T***'s **BoomBox** features an interactive Remix screen to add echo and effects to either your own arrangements or the songs provided on disk. BoomBox transforms your Amiga into a beat box and promises to make a rapper out of anyone. You can loop sections of the grooves, repeat them, or just jam along by triggering samples from the Amiga's keyboard or a joystick. BoomBox puts y-y-y-y-you in control! (RS# 113.)

Prefer jazz over rap? **Jazz Through MIDI** (*New Sound Music*, $49.95) promises fun and easy improvisation at your own pace in a variety of jazz styles. To use the program, you'll need a MIDI keyboard or sound module, a sequencer, and a MIDI interface. It provides performances that you can play in various keys and tempos, and it lets you mute any parts and substitute your own playing.

Whether you're a novice, intermediate, or advanced player, Jazz Through MIDI has skill levels for you. Beginners cover ear-training drills and exercises for the II-V-I progression, cycle, and more. Intermediate levels feature 54 accompaniments and solos set up in 8- to 24-bar phrases. Advanced players can choose from 12 popular songs—arranged in 32- to 48-bar phrases—some of which are note-for-note renditions of original recordings. Every sequence is written out so you can see as well as hear what's happening. (RS# 114.)

Need to compose background music ►

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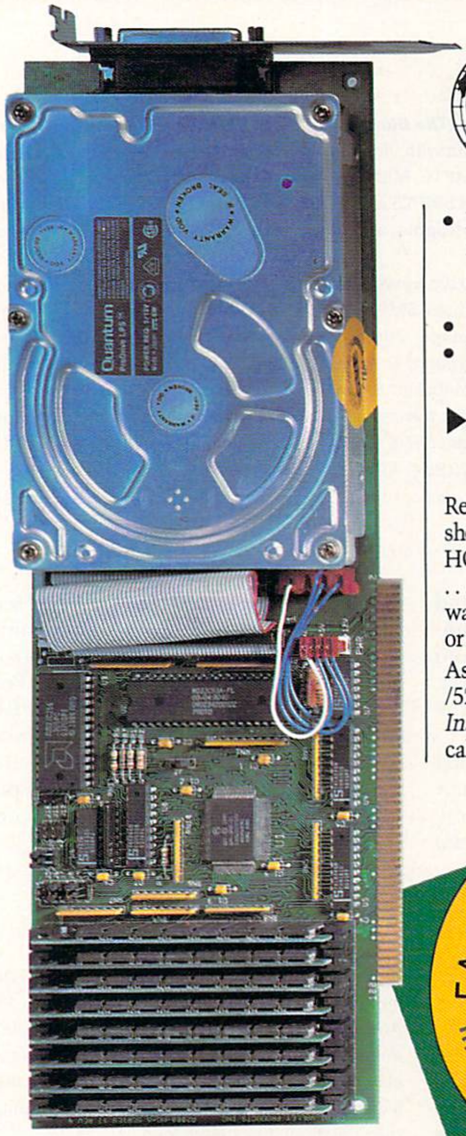
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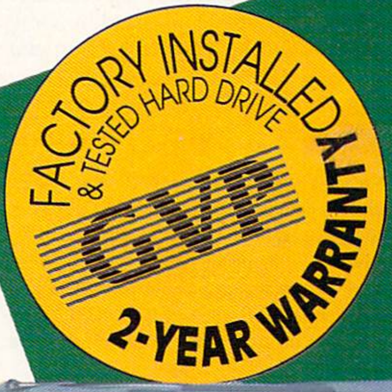
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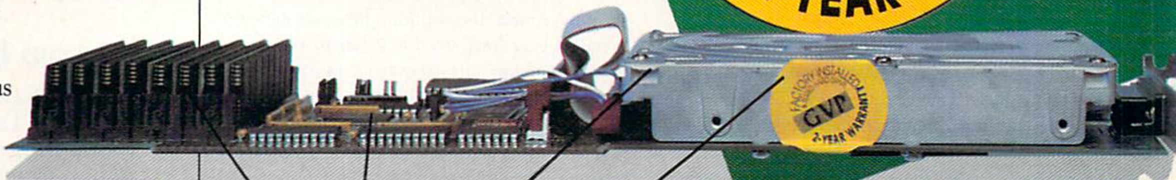
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of specific lengths for your multimedia presentations? Lack music training? ***Digital Expressions*'** **Video Music Box** ($109, plus $6 shipping) wants to help by generating basic instrumental parts for common musical styles. Prearranged patterns and chord progressions get you started; with note-editing tools, you can add new melodies, chord arpeggios, or fills fitting the chord progression. Your resulting production can include multiple segments with different tempos and volumes, and you can preview them either through MIDI or through the Amiga's internal audio. When you're satisfied, save your tunes as MIDI or IFF-SMUS files for use with any authoring software. (RS# 115.)

Match Boxes

A universal synchronization box, **SyncPro** (***The Blue Ribbon SoundWorks***, $199) works with any application supporting MIDI time code to sync with video and audio hardware. The unit supports all major synchronization formats, including SMPTE, MIDI, and Song Pointer. It can generate and read all SMPTE frame formats, duplicate recorded SMPTE stripes, convert SMPTE to MIDI time code, and more. It also promises to recover from tape dropout, and offers a remote-start accessory for Super-JAM! and Bars&Pipes Pro. (RS# 116.)

***Black Knight Peripherals*' SAM** ($299) also works with Bars&Pipes, MusicX, and all music software supporting MIDI time code. SAM, an "integrated SMPTE and MIDI time-code converter," syncs the Amiga and any attached instruments to audiotape, videotape, or any SMPTE signal, and it offers four MIDI-out ports, one MIDI-in, a serial pass-through, and a front panel that displays the unit's operational status. A built-in CPU generates crystal-locked SMPTE and MIDI code without overhead. The unit reads and writes SMPTE in PAL, NTSC, film format, in both forward and reverse directions, from less than 25 percent to 200 percent of normal speed. SAM's software includes a Timecode Tool for monitoring and recording time-code signals. (RS# 117.)

Editorial Focus

FutureVideo's new **Pro MkII** ($695) and **Pro/TC MkII** ($1198) video edit controllers are an evolutionary step up from the firm's EC1000 Pro series units. In fact, FutureVideo will upgrade EC1000s to the new specifications.

Among the refinements that the MkII units offer are the ability to read the new 8mm RC time code (supported by some Sony, Ricoh, and Yashica Hi8 camcorders) and to edit within three frames. A new seven-digit LED panel displays hours/minutes/seconds/frames of RC code, control-track timing, and, in the case of the Pro/TC model, longitudinal SMPTE or EBU time code. The units are compatible with camcorders and VCRs equipped with the Control-L connector or Panasonic's 5-pin edit terminal, and with some RS-232-controlled professional VCRs. (RS# 119.)

Better To See, My Dear

It's new. It's two. **Flicker Free Video 2**, that is. ***ICD*** used recent advancements in VLSI circuit technology to add a number of features and reduce the size of its display enhancer, which fits under the Denise chip of Amiga 500s, 1000s, and 2000s. The board's retail price is $299.96; registered owners of the original product can trade up for $139.

Like the earlier version, FFV2 eliminates interlace flicker and visible scan lines. It promises full compatibility with all software, DOS revisions, and Commodore's enhanced chip set; it automatically bypasses Productivity mode and lets you manually bypass SuperHiRes mode with an optional switch. The latter feature depends on your monitor's provision of a 15.75-KHz horizontal scan rate, but in any case, FFV2 requires a VGA or multisync monitor. The board provides automatic fine tuning and comes with **Flicker Free Video Preferences**, software that allows adjustable vertical refresh frequency for a steadier display.

Flicker Free Video Preferences is also available by itself for $29.95 (owners of the original board can buy it for $15). The program does not limit itself to use with FFV, however. Both the Amiga 3000 and Commodore's A2320 display-enhancer board support all its features. You can also use it with any other display board, or sans a display enhancer and with any monitor, though this may limit its capabilities.

In any case, the program lets you raise your vertical scan rate (to 100.2 Hz) to reduce eye strain, or lower it (to 49 Hz) to create a larger display. It also lets you adjust Workbench overscan for maximum display area and adjust the number of Workbench 2.0 screen colors from two to sixteen. The software runs not only under DOS 2.0, but also 1.3 and 1.2. (RS# 118.)

Overscan is compiled by Barbara Gefvert, Linda Laflamme, and Tim Walsh. Send your news, new products, and network information to Overscan, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458.

Overheard

MultiCon's AmigaMPD is a freely distributable videotape showcase for Amiga-only art of all sorts: music, still and animated 2-D and 3-D graphics. The series project is intended to educate the public on the Amiga's creative prowess. You can submit your work in a variety of formats and media; anything placed in the series becomes "multimedia public domain." To see what's on the latest edition, send a blank VHS or SVHS cassette and return postage to MultiCon, 2037 E. 25th St., Oakland, CA 94606. Call 510/261-1001 for details... and don't forget to pass it on!

In Control

***Mellen*'s ADAPT** (Advanced Data Acquisition Processing Technology) system for the A3000 promises applications to research and industry. It can perform a variety of complex control operations while generating graphics for real-time plotting of data acquired.

The hardware/software combination monitors and controls up to 48 individually configurable channels. It also accepts a variety of process-variable (PV) inputs (including temperature, pressure, millivolts, and other analog signals) and uses an 18-bit A/D microprocessor for increased resolution.

Each system comes with customized menu-driven software, including up to 500 program segments or steps. A graphical interface displays PV data in real time, without processor interruption. Visual PID loop tuning eliminates guesswork in selecting PID values by plotting each term and the effect of your tuning changes on PV stability. (RS# 121.)

Celluloid Heros

ASDG's Art Department Professional now supports Lasergraphics' LFR and LFR Plus film recorders ($8750 and $13,750, respectively), thanks to a **new program module** ($250). Both recorders come with a 35mm camera back, or you can opt for 4×5, 8×10, or pin-registered motion-picture backs. With the help of FRED, ASDG's animation controller, you can write entire animations—including sophisticated wipes, dissolves, and digital compositions—automatically to film. (RS# 122.) ■

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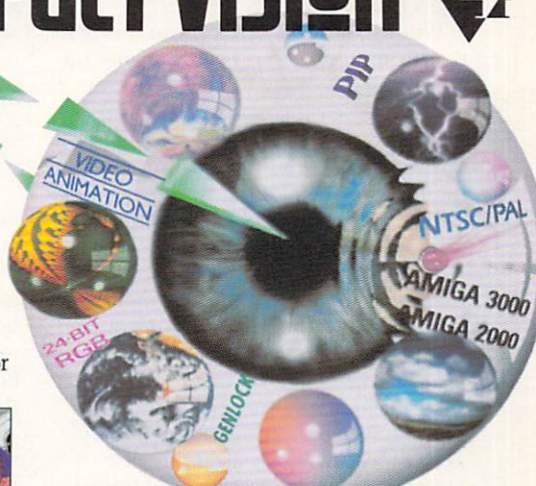




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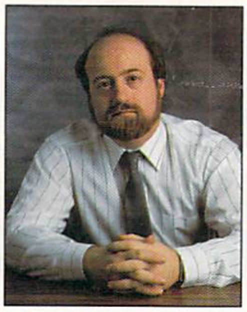
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HELP KEY

Gazing into his crystal ball with the saltshaker handy, Lou fields rumors of new chips and the A600.

By Louis R. Wallace

Q: *I was reading the other day that Commodore is working on a new set of custom chips for the Amiga. The message (it was a rumor on a BBS) said that it would have more colors and higher resolutions, plus a lot of other undisclosed features. Is this true? When are they coming out? Will this be an easy upgrade like AmigaDOS 2.0? And will I be able to make use of them in my A500?*

J. Andries
New Orleans, Louisiana

A: Well, the first thing I have to say is that one should always take rumors with a large grain of salt, especially when they are found on BBSs. Sometimes people write such "new product" announcements as a joke, but then they are taken as truth by somebody else, get downloaded and then uploaded again on some other board where no one realizes they were just someone's pipe dream.

With that said, I can tell you it is true that Commodore has been working on a new version of the Amiga's custom chips for several years now. Official details are not yet available, but it is safe to assume that they will support higher color resolution as well as other enhancements (hopefully very significant ones).

At the time I write this (early June), there have been no announcements from CBM on the specifications or release dates of the chips or the products they are designed to work with. I hope we do hear something this year, and you can be sure that we at *AmigaWorld* are just as curious as everyone else about exactly what will be announced and when. You can also count on us to bring that information to you as soon as we get it.

Will it be an easy upgrade like AmigaDOS 2.0 and will it work in the A500 (or other existing Amigas)? I can't yet say, as no details have been released, but if I were to go out on a limb and take a guess, I would say that I expect the first sign of any new chips will be in some new model Amiga and not as an upgrade kit for existing machines. Upgrading our existing machines might be a bit difficult, although certainly not impossible. It's very likely that any new chips will not be pin compatible with the existing chips, so they wouldn't fit in the same sockets.

It's also possible, perhaps likely, that they will be entirely new chips, and not just enhanced versions of the older ones (as was the case with the Enhanced Chip Set upgrade). If that's the case, our existing motherboards won't be able to use any new chips, and we just might have to get new motherboards in order to take advantage of the new chip set and its features.

You can be sure that we at AmigaWorld *are just as curious as everyone else about exactly what will be announced and when.*

Finally, in order to use any new hardware that Commodore might develop, the Amiga will need some changes to its system software. The challenge to the OS programmers is to adapt Amiga operating software to take advantage of any new features, yet keep it backward compatible with the existing hardware and software. All of this will take some serious work, but I am confident it will happen.

Of course, all of this is pure speculation on my part, so keep those grains of salt handy. To find out what will really happen, we will just have to sit back and relax, enjoy our existing machines and wait and see what the future brings.

Q: *OK—I'll bite! Just what the heck is this Amiga 600 I hear is shipping in Europe? Is it just a modified A500, or is it a new computer? And if it's new, why isn't it available here in the US?*

M. Miller
Los Angeles, California

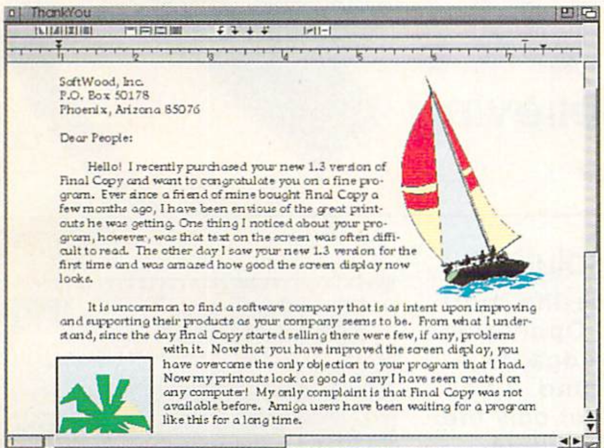
A: Boy, this is the month for questions about new and unreleased CBM products! Well, the A600 is a new model Amiga—not just a revamped A500. There are two versions. The entry-level model contains a single floppy drive, one meg of RAM, one of the memory-card slots such as is found on CDTV (and which is becoming a computer-industry standard), and AmigaDOS 2.1 in ROM. The A600HD is the same machine with an internal hard drive.

Why isn't it shipping here in the US? Basically because Commodore is an international corporation, with independent business units in each country. They all have to respond to their market forces and government regulations on new computer products, so sometimes one country can get a product out faster than another.

In addition, Europe is a bigger market for consumer computers then the US, where more people use high-end Amigas for vertical applications. So it makes sense to release a new low-end Amiga in Europe as soon as possible. However, while no announcement has yet been made about the A600 in the US, I do expect to hear something soon. Stay tuned. ■

Need some help or advice about Amiga matters? Send your questions and problems to Help Key, c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

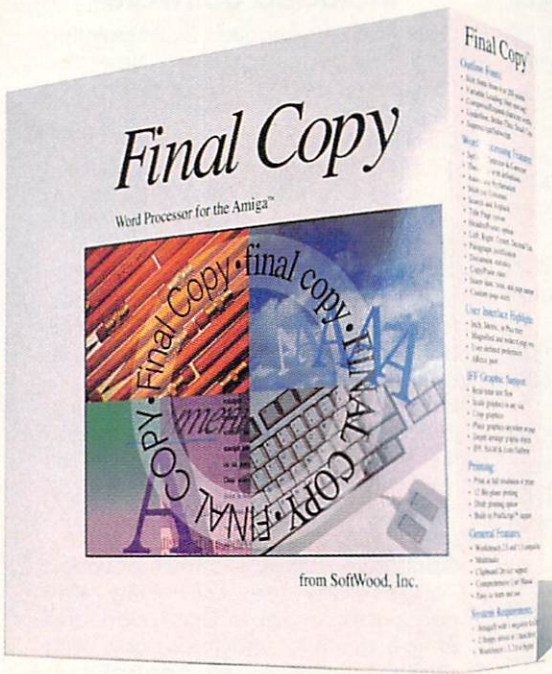
NO BRAG, JUST FACTS!



Version 1.3's new screen display is easy to read!



Best output of any Amiga word processor!



To be a winner you've got to be a whole lot better than the rest. Final Copy is the first and only word processor for the Amiga that gives high-quality printing on any 1.3 or 2.0 Workbench supported printer. It comes with a 116,000 word spelling detector and corrector, 470,000 synonym thesaurus with definitions, 35 outline typefaces, multiple newspaper style columns, IFF graphic support including 24 bit ILBMs, real-time text flow around graphics, 12 bit-plane color printing, typographic controls, ARexx port, and true WYSIWYG PostScript® printing.

As one of our customers said, "You don't have to be a rocket scientist to see Final Copy has the best printing of any Amiga word processor."

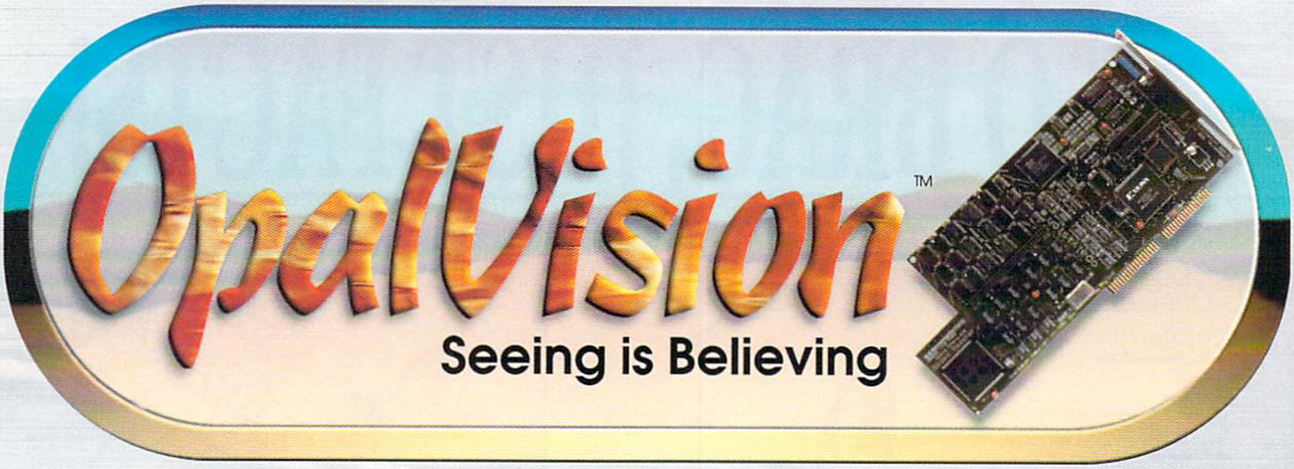
Comparison Chart	Outline Fonts Included	Crop Graphics	Load Simple HAM graphic	Thesaurus Synonyms	Speller Words	Snaking Columns	Graphic Text Flow	Automatic Hyphenation
Final Copy 1.3	35	Yes	3.5 sec.	470,000	116,000	1-6	Yes	Yes
ProWrite 3.2®	0	No	1 min 20 sec	300,000	100,000	1-5	No	No

Comparison Chart	Price	Frame Graphics	24 Bit ILBM Support	Thes. with Definitions	Page Views	Print 1 pg. Document	ARexx	Use Amiga Clipboard
Final Copy 1.3	$99.95	Yes	Yes	Yes	25-400%	53 sec.	Yes	Yes
ProWrite 3.2®	$174.95	No	No	No	No	2 min 5 sec	Yes	No

$99.95 VISA & MASTERCARD **1-800-247-8314** SoftWood, Inc.

Circle 48 on Reader Service card.

Centaur Development presents the most brilliant new product line for the Amiga™...



The complete 24-Bit graphics and video solution.

OpalVision thrusts the Amiga back into first place as the most powerful video and graphics computer in the industry. OpalVision links the ultimate video painting software with cutting-edge, high-quality hardware providing magnificent graphic and video capabilities. OpalVision's modular design lets you select only the features you need while providing expandability for the future.

OpalVision MotherBoard

- The core of the OpalVision system. It is a true 24-Bit frame buffer and display device with 16.8 million colors available for every pixel.
- Uncompromised, 24-Bit higher-than-broadcast-quality, crystal-clear images which far surpass any composite video or HAM system.
- Amiga graphics and animations can appear in front of or behind OpalVision images on a pixel-by-pixel basis.
- Operates in all standard Amiga resolutions up to a maximum of 768 x 480 pixels (580 in PAL).
- Double buffered 24-Bit and 15-Bit animation can be performed in medium and low resolution modes while 8-Bit double-buffered animation is available in all resolutions.
- VLSI Microcode Graphics Co-processor enables resolution changes, stencil modes, a host of transition effects and smooth scrolling between screens.
- "Palette-Mapped" design updates screen colors in real-time. Fade pictures in and out and change their palettes on the fly.
- Available in an internal version which occupies the video slot of the Amiga 2000 and 3000 series computers. The external version connects to the RGB port of any Amiga, including the Amiga 500 and 600 series computers.
- Equipped with 1.5 MB of display RAM
- Automatically self-configures for NTSC or PAL operation.

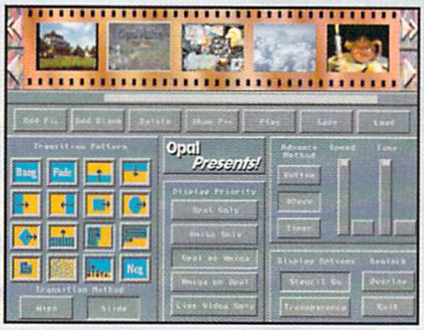
Included Software

Opal Paint: Unequalled 24-Bit painting and image processing. See the following pages for a complete description.

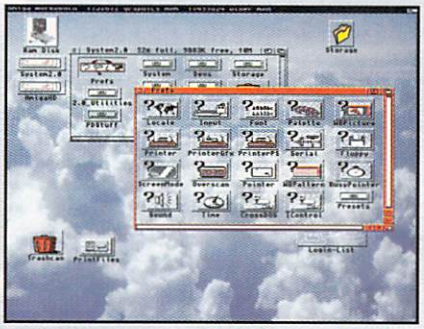
Opal Presents: A comprehensive, icon-driven presentation program offering complete control over OpalVision images, Amiga graphics and live video (when the Frame Grabber/Genlock is installed). Includes numerous built-in transitions and effects including wipes, fades and scrolling effects. Takes full advantage of OpalVision's double buffering and intelligent image pre-loading to minimize delays. Utilizes 24-Bit image thumbnails in both editor and file requester. Trigger transitions by mouse button, timer or AREXX commands. Initiates CLI and AREXX scripts. Fully multitasking.

OpalVision HotKey: Display OpalVision images anytime by using key combinations. Show OpalVision and Amiga graphics simultaneously, with single keystrokes to control two different OpalVision screens, priority masks, genlocking and other OpalVision features. Multitasks with all Amiga software to provide 24-Bit backdrops for Amiga graphics. AREXX compatibility integrates all OpalVision features into Amiga environment.

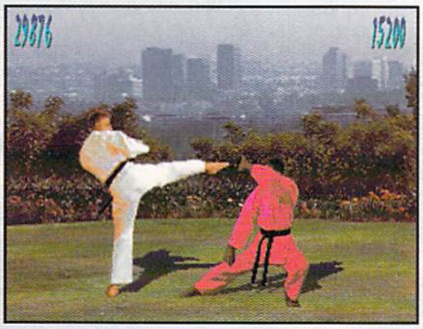
King of Karate: The world's first 24-Bit personal computer game! An exciting karate competition which is lots of fun and an excellent demonstration of OpalVision's capabilities.



Includes OPAL PRESENTS — a feature-packed, 24-Bit presentation program.



Freely combine 24-Bit and Amiga graphics. Run Workbench over an OpalVision screen.



Includes KING OF KARATE — The world's first 24-Bit personal computer game.

OpalVision Enhancement Modules



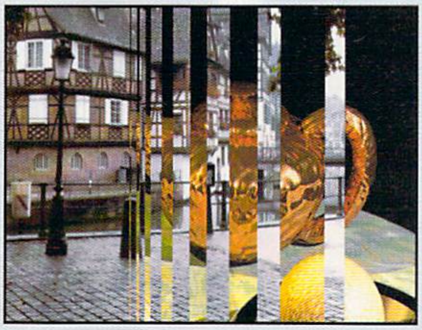
Add Genlock and Framegrabbing for unlimited video capabilities.



Multitasking HOTKEY software lets you show 24-Bit pics any time. Run DPaint™ ANIMS on a 24-Bit background.



OpalVision Scan-Rate Converter for non-flickering, rock-solid ouput.



Revolutionary "Roaster" chip provides unlimited video digital effects.

A complete range of enhancement modules will be available soon. Add framegrabbing and genlocking, de-interlacing, Digital Video Effects and input switching capabilities. OpalVision's modular design circumvents the usual problems with incompatibility and loss of signal integrity associated with the external components available from third parties and the "Rat's Nest" required to connect them. The expansion modules connect directly to the OpalVision Mother Board without tying up Amiga slots. Adding all of the modules creates a complete 24-Bit Amiga desktop video system.

OpalVision Frame Grabber/ Genlock Module:

- A true 24-Bit frame grabber, genlock, composite decoder (color splitter), composite encoder, 256-level linear keyer with alpha channel output and live video effects processor.
- Broadcast-quality S-Video (S-VHS or HI-8) or composite input and output.
- No external splitter required. Uses the Sony broadcast camera chipset for quality in excess of broadcast standards.
- Instantly freeze and save multiple video frames or a sequence of frames as 24-Bit images. No still frame or signal preparation required for image grabbing.
- High-quality integration of 24-Bit OpalVision and Amiga images with video. Define a 256-level transparency overlay (alpha channel) for OpalVision or Amiga images so live video can be displayed through transparent and semi-transparent portions of the image.
- All features are software controlled for fading, source switching, keying, etc.
- Uses external video or internal Amiga sync.
- Installs directly on the OpalVision Mother Board. No external wiring or power supply required.

OpalVision Scan-Rate Converter

- Display Amiga Graphics, OpalVision 24-Bit images and live video as rock-solid, non-interlaced, flicker-free images on any multi-scan or multi-sync monitor.
- Acts as an independent 24-Bit frame buffer for two-screen multimedia applications.
- Perfect for high-resolution applications such as desktop publishing and word processing, paint and ray tracing software, etc.
- Requires and plugs into the OpalVision Mother Board. No external wiring or power supply needed.

OpalVision Quad-input Production Switcher

- An external unit which plugs into the OpalVision Frame Grabber/Genlock for software-controlled switching between two video sources.
- Incorporates four video input signals each with its own color splitter. These four inputs can be assigned to A and B sources for switching in any combination.
- Perform cuts, dissolves, wipes and all the transitions made possible by the OpalVision Roaster Chip between two different sources.
- Each input includes both S-Video (S-VHS or Hi-8) and composite jacks. Output is provided in both S-Video and composite format.
- Includes a jack for input of house sync, and output of the alpha (transparency) channel as a 1V p-p signal for production mixing desks.
- Requires and plugs into the OpalVision Frame Grabber/Genlock board. No external power supply needed.

OpalVision Roaster Chip

- Real-time processing and morphing of live video, OpalVision images or standard Amiga output. Take any live video signal. Flip it. Scale it. Wrap it on a sphere. Wave it like a flag. Do page turns to reveal a second source image. Provides an infinite variety of amazing, real-time Digital Video Effects.
- "Picture-in-Picture" capability allows the display of full 24-Bit live or frozen video in a scalable window on the Workbench. Zoom in on a portion of the image and pan around for a close-up look.
- Includes software to design and accurately sequence custom video effects and transitions. Includes an expandable library of useful wipes, dissolves, wraps, etc.
- Plugs into the OpalVision Mother Board. The Roaster Chip is a fully integrated part of the OpalVision system and is fully compatible with all other modules. For effective use, the Roaster Chip and software requires the Frame Grabber/Genlock Module.

Circle 162 on Reader Service card.

OpalPaint

An unequalled painting and image manipulation program. Fast. Real-time. Full 24-Bit. OpalPaint gives you complete control over OpalVision's 16.8 million color palette. Includes a full-range of drawing tools and image-processing modes.

Tools

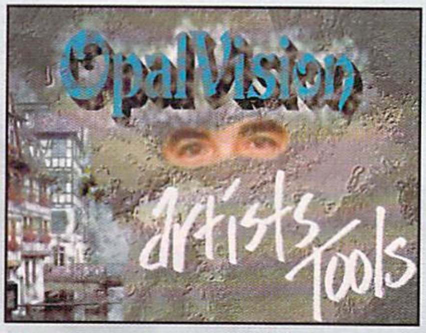
- Includes all standard painting tools: Sketch (Dotted & Freehand); Line; Filled/Unfilled Outline; Arc; Filled/Unfilled Ellipses/Circles/Rectangles; Text; Brush Cut.
- "Rip and Replace" repeats last drawing action after moving one pixel in any direction. Very useful for precise placement of brushes and objects.
- Definable level of anti-aliasing in any mode and with any tool.
- Definable level of global transparency for all operations, or set transparency levels of individual RGB or HSV components.
- Texture mapping with 32-Bit brushes, using any Drawing Tool, Drawing Mode and Transparency Gradient.
- Transparency overlays "painted" using Alpha Work Mode can be attached to cutout for 32-Bit brush.
- Magnify tool with complete zoom in/out control.

Modes

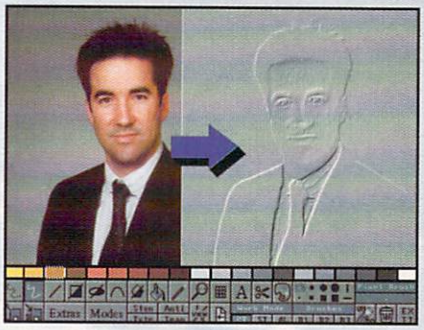
- 18 built-in Drawing Modes, including Paint, Tint, Colorize, Brilliance (Brightness), Contrast, Gamma, Additive, Subtractive, Mosaic, Smear, Smooth, Shade, Sharpen, Negative, and many others. Most modes have independently adjustable parameters via an on-screen slider; for example, you can adjust the Smear amount from 1% to 100%. All Drawing Modes are used in conjunction with the drawing tools; apply effects to either limited areas or the entire image.
- Additional Drawing Modes on disk for unlimited image processing power and expandability. Includes such Drawing Modes as Add Noise, Convert to Grey, Median Filter, Emboss, High-pass Filter and Logical Operations.
- True 24-Bit multiple color gradients, with adjustable radial, linear, horizontal, vertical, border, and point gradient fill choices; gradient colors can be either RGB or HSV color spreads.
- Transparency gradients. Define multiple levels of transparency for a fill, similar to color gradients. Can be used alone or in combination with color gradients.

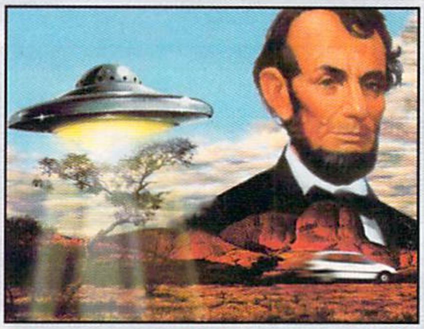
Resolutions / File Formats

- Loads IFF (any resolution, including HAM), IFF-24, JPEG, OV_FAST. Saves IFF-24, JPEG and OV_FAST.
- Define unlimited spare pages. Spare pages can be any resolution and page size.
- Rubthrough from any one spare page to the same or another spare page.
- Supports all resolutions of the OpalVision card.
- Page size in any resolution is definable up to the limits of available memory, or hard-drive space if the virtual memory option is utilized up to 32,768 x 32,768 pixels. Large images can be scaled for viewing on standard screen.
- Two different stencil types: Keep-out stencils (like artist's friskets) which can be drawn with the painting tools over any area of the image, and color stencils, which can include or exclude ranges of color based on HSV tolerances.
- With one mouse click switch between three different Work Modes that all use the same Drawing Tools: Paint mode, for normal painting and image processing; Stencil Mode for drawing keep-out stencils, and Alpha mode to paint with grey scales representing transparency. This transparency mask is used with 32-Bit cutout brushes and is supported by the OpalVision Frame Grabber/Genlock for semi-transparent live video overlays.
- OpalVision Frame Grabber/Genlock can grab images or cutout brushes directly into spare pages and the work area.
- Combine Drawing Tools, Drawing Modes, Texture mapping, Transparency and effects for incredible image manipulation power.



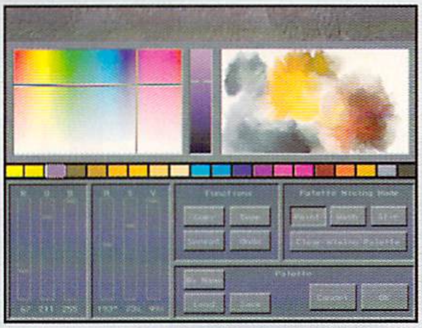
Create real-world artistic effects with exclusive Artist's Tools and Paper Types.


Utilize full Image Processing capabilities for desktop publishing and photo enhancements.


Composite multiple images quickly and easily with seamless, 24-Bit color accuracy.



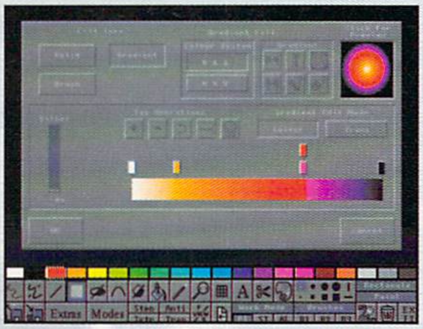
Use "Brush Warping" for dynamic surface-mapped effects.



Make quick and precise color selections using the versatile 24-Bit Palette Requester.



Generate and manipulate Video Titles with complete Amiga font support (including Colorfonts).



Easily create versatile, multiple-level color and transparency gradients.



"Thumbnails" give you miniature images of all graphic files.

Palette Control

- Supports several methods of real-time 24-Bit color selection. Choose colors from RGB & HSV sliders, use the 16.8 million "color picker," choose from a list of named colors, or use OpalPaint's color mixing area to create your own.
- A working palette of 260 selected colors is available at all times. Load and Save custom color palettes. This palette can be changed at any time without changing colors already in the image. Colors in gradients, smoothing, etc... are not limited to colors in the working palette.
- Includes pre-defined palettes, such as Pastels, Metals, Ocean, Skintones, Camouflage, Fluorescents, etc. Each has its own pre-mixed mixing area for easy color selection.

Unique Features

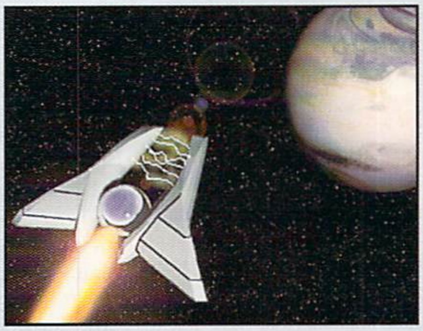
- Easy, intuitive icon-based interface. No cluttered screens of buttons or layers of menus.
- Fast, real-time operation. No waiting for buffer updates or working on a second screen.
- Virtual memory support. Store unused portions of the image, spare pages, or spare cutout brushes on hard disk to save memory. This allows you pages much larger than memory would typically allow.
- Unique nozzle brushes can be independently used with adjustable "Artist's Tools" such as a perfectly smooth airbrushes, pencils, charcoals, texta, oil paints, etc. In addition, the "paper type" can be adjusted, such as smooth, rough, watercolor paper, etc. for realistic, real-world effects.
- "Magic Wand" allows automatic filling or cutting or irregular objects using edge detection.
- Supports pressure-sensitive Wacom™ drawing tablet in conjunction with Artist's Tools for incredible real-life effects. (Requires Workbench 2.0)

General Characteristics

- Load/Save file requesters show an "Art Gallery" of 24-Bit "thumbnails" or miniature representations of Images, Cutout Brushes and Palette sets on disk for visual location of files. Create Art Gallery thumbnails for existing IFF images.
- "Undo" button for any operation.
- "Dynamic Undo" Use the right mouse button as an eraser to paint from the undo buffer with any tool.
- Keyboard equivalents follow DPAINT™ standard where possible.
- Full AREXX support and fully compatible with Workbench version 2.0.



Frame Grabber/Genlock allows real-time color processing of live video: glows, shines, posterizations, nuclear effects and more.



Retouch, enhance and modify rendered 3D images.

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REVIE

Publishing flyers, newsletters, or booklets.

Professional Page 3.0

Gold Disk, $295.
Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 2MB RAM, hard disk, ARexx v. 1.15.
Recommended system: 4+MB, hard drive, ARexx, 68030 accelerator.

For a long time, whenever I looked at Mac and PC desktop-publishing products, I wondered if I was wasting my time with the Amiga—but I wonder no longer. Professional Page 3.0 is the first release in which Gold Disk appears to be not just selling a desktop-publishing program, but competing with the big guns.

Previous versions had quite a few holes, but this edition fills most of them. For example, page sizes up to 48×48-inches (and larger for output) are now possible, and the long-overdue undo button is included. Auto-tiling is supported, and the color-separation routines have been improved.

Two new hot links, one to Pro Draw 3.0 (not released as of this writing) and the other to Art Department Professional, let you edit drawings from Pro Page. (A third links you to Professional Calc.) Even better, a new text-wrap feature lets you irregularly wrap text around a structured-drawing object. Wrapping bitmapped graphics isn't directly supported yet, however, so while you can flow text around the outline of a vector-based graphic of a boat, you can do so only around the rectangular bounding box of a boat that's bitmap-based.

Professional Is the Word

To simplify your installation efforts, Pro Page 3.0 provides its own Install utilities and several support and configuration files. Use them. They are the best improvements of the new version.

All Amiga programs should be as configurable as Pro Page. PPage.ini, for example, substitutes itself for numerous Assign statements. The only Assign command now required is to the CGFonts directory.

PPage.DFLT is a configuration file that tells Pro Page where to look for your project files. Upon exiting, the program updates PPage.DFLT to your last project's directory. The next time you use Pro Page, the file requesters automatically display those same directories. This causes a problem if you decide to work on another project where the location of your files differs from your previous project, or if more than one person uses the same computer. I've worked around this by starting Pro Page from a script file that copies a master PPage.DFLT file before executing Pro Page.

The most powerful configuration file is PPage.config, which lets you customize how Pro Page starts. You can specify the initial text-greeking sizes, font size and type, page magnification, grid size, whether to start in wireframe mode, and so on. This useful file is also easy to customize.

After all these years, Pro Page *finally* supports Adobe Type 1 fonts. The supplied FontManager program converts Type 1 fonts into Compugraphic format. To convert a font, you need both the printer font and the Adobe metric file. (The program provides additional save modes for accelerated Amigas.) Once you transform them, you can permanently download your PostScript fonts to your printer with the Download program. Font support is further improved by letting you specify font sizes to an eighth of an inch and by adding five more Compugraphic fonts: Caslon 540, CG Omega, Garth Graphic, Shannon Book, and Unical.

Pro Page's Information requester now acts as a check list for service bureaus. It lists all PostScript fonts and EPS files used in your document, as well as all bitmap files. Unfortunately, there's no way to print this information to a text file.

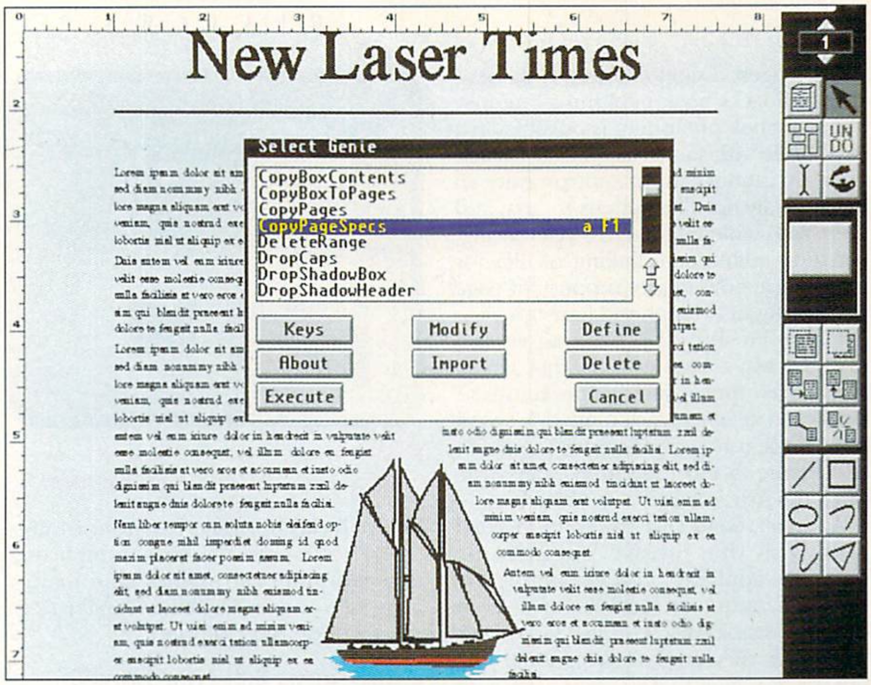
Importing text files has been improved by creating text-import filters. New additions include Kindwords, excellence!, and ProWrite. I just wish other nonAmiga formats were supported in addition to WordPerfect (PC) and ASCII (PC). (How about some Mac formats, too?)

Rub The Lamp

The most noticeable new feature is the collection of Genies (analogous to Microsoft Publisher's Page-

To locate the vendors of the products reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 106.

W S



Professional Page 3.0's Genies make layout a snap.

Wizards). Pro Page now has an ARexx interface, and each Genie is an ARexx script. Currently, there are six types of Page Genies and over 50 Function Genies, and Gold Disk is encouraging third parties to write more. Most Genies work alike: Select it, respond to the questions, and the Genie does all the work.

You use Page Genies in the same manner you create any other page—from the Page/Create menu option. You can create various Avery labels, business reports, envelopes, full-page ads, newsletters, and twofold brochures.

Function Genies are plentiful (although I could wish for dozens more). Modifying your text, for example, is as easy as clicking a mouse button. You can change all letters to upper case, create superscripts and subscripts, create drop caps and small caps, globally change fonts, or capitalize the first letter of selected words. You can delete, move, or copy a range of pages or modify their attributes. You can insert another Pro Page document within your current one. You can convert boxes into columns, change box attributes throughout the document, copy a box's contents to a range of boxes, or perform a global search-and-replace.

There's a Genie that creates as many pages as needed while importing text, and another creates timed backup files. Still another finds all occurrences of a style tag and returns a list of text using that tag. Two separate Genies create tables (limited to drawing boxes around imported data). Other tidbits include entering and retrieving personal information, creating drop shadows, copying box attributes, aligning boxes, changing and saving configuration preferences, performing math calculations, converting typesetting units, and invoking ARexx commands from a command line.

Don't Stop Now...

Although I'm pleased with all the new features, I'm frustrated by what wasn't included. For example, there is no way to print only odd or even pages or to provide print spooling. I'm also surprised that there's still no support for decimal tabs, dot leaders, paragraph numbering, or creating fractions, and you still can't produce several standard typesetting characters, such as an em-dash, true quotation marks, or ligatures.

These missing characters also create holes in specialized typefaces, such as Zapf Dingbats or Symbol, and the Pro Page manual shows many unused spots in the keyboard mapping. There must be a solution to this problem somewhere. Dual-page and full-page monitors are ignored, as well, as are AmigaDOS 2.0's virtual screens. In addition, you're still stuck working with one document at a time. Work-group publishing and special networking tools aren't supported, either. Gold Disk and all other Amiga developers must consider this if the Amiga is ever to be accepted as a business tool. While on-line help is still not included (except for Genies), you do receive a separate help-book program.

Few improvements were made to the Article Editor (AE). Unlike Pro Page 3.0, the AE doesn't have that crisp 3-D look of Workbench 2.0. It still uses the Sort button in the File Requester, which Pro Page mercifully discarded in version 2.0. I wish the AE knew where I store text files; PPage.DFLT provides this information, but the AE doesn't use the new configuration files. Clipboard and ARexx support are missing, and the macro language, although useful, ignores file requesters. ►



YOUR TURN!

The ARexx interface in Professional Page 3.0 is as extensive as any I've seen, and the ARexx Genies open up amazing possibilities. The Page Genies give novice users a quick way to make a variety of standard formats. The Function Genies take much of the drudgery out of page creation. I want more, however. I'd like to be able to get information from Pro Page about the width of a string in a chosen font and size. It's a bit too difficult now to find the right size for a box when the size of the box is not known when a function is written.

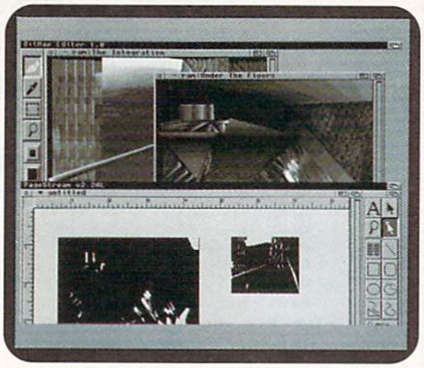
Robin Evans
Seattle, Washington

My biggest disappointment is that Pro Page still lacks book-publishing features. I'm sure book publishing is possible on a small scale with some customized Genies. Still, you cannot conveniently produce an index or anchor illustrations to text, and there's no table editor, cross-referencing, equation editor, auto-linking of files for multichapter designs, or support for page numbering of two-ups and four-ups.

Unlike Pro Page 2.0, I haven't yet run into any major bugs with 3.0, but I have found a few minor quirks. The Auto-Save Genie and default page settings don't work from PPage.config, and I couldn't send text back home to Pro Page from TransWrite when the Article Editor was loaded.

All in all, Gold Disk can hold its head high with this release. An attitude change is apparent, and I hope the developers continue to add features. Even though I still have a wish list, Gold Disk has finally delivered a professional version of Pro Page that's competitive with other packages, including those on the Mac and PC. It's still confined in practice and nature to page publishing, but at that level it now performs well.

—Daryell Sipper



PageStream 2.2 lets you subscribe to bitmaps from HotLinks Editions' BME.

PAGESTREAM 2.2

Soft-Logik, $299.95.

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 1MB RAM, two floppy drives.
Recommended system: 2MB RAM, hard drive, accelerator.

All-level desktop publishing and sign making.

HOTLINKS EDITIONS

Soft-Logik, $99.95.

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 1MB RAM, two floppy drives.
Recommended system: 2MB RAM, hard drive, accelerator.

Text and image editing, interprocess communications.

As one of the Amiga's top two desktop-publishing programs, PageStream is known for its fluid and easy-to-use interface, its extensive file-format importing and exporting capabilities, and its vast array of features. The latest version (2.2) improves on this tradition.

PAGESTREAM 2.2: NEW LOOKS, NEW HOOKS

The first thing you will notice are the changes to the windows, requesters, and tools. All now sport the AmigaDOS 2.0 3-D look. Under 2.0, PageStream 2.2 uses the standard file requester and opens on the Workbench screen if so directed by the Tool Types in its icon (or the command line options if run from the Shell). Even under 1.3, PageStream 2.2 retains 2.0's dimensional appearance.

From the functionality side, requesters now allow double-clicking on list entries (such as file names) to select and dismiss requesters. In addition, many keyboard/menu combinations now exist to handle such situations as creating and printing documents with previously established settings. In the toolbox, some tools were merged and a couple of minor new ones added, including a zoom control.

Soft-Logik has also added or improved modules for import, export, and control of output devices (including plotters and sign cutters). For example, PageStream now controls HPGL-compatible plotters and sign cutters, the Roland CAMM1 sign cutter, and color PostScript printers. Moreover, the PostScript driver is improved. On the import side, 2.2 offers modules for PCS (PC Paintbrush format), EPS (Encapsulated PostScript) for ASCII, Mac, and IBM formats, as well as Adobe Illustrator EPS.

By far the most important improvement in PageStream is the addition of HotLinks, Soft-Logik's contender for an interprocess communication standard. Whereas ARexx is primarily intended for passing commands between programs, HotLinks is intended to pass data. Also unlike ARexx, HotLinks can communicate between two programs that may not even be running. It can even communicate between more than two programs; one program's update to its data can be seen by all the others that subscribe to the data, whenever they reference it. If one or more HotLinks subscribers are running when an update takes place, they are notified of the change and can automatically update themselves with the changed data.

For example, consider a common PageStream scenario: You create a document in a text editor, set up a layout in PageStream, pour the text into the layout's columns—and then find an error in the text. If the necessary change is small, you might make it in PageStream and then export the new text to the document. For an extensive correction, you'd change the text in the text editor, save it to disk, clear the columns in PageStream, and re-import the text—not much fun.

With HotLinks, it's much simpler: In PageStream 2.2, you "subscribe" to an "edition" of text, rather than importing it. If the edition is updated by a HotLinks-compatible text editor, the text in the column is automatically updated. The same is true for images, and will shortly be true for structured drawings.

YOUR TURN!

PageStream 2.2 is a major advance. The screen refreshes are faster, and printed output looks great on both dot-matrix and PostScript printers. The inclusion of magnification in the toolbox as well as the menu is very handy. PageStream 2.2 is one program that can demonstrate the Amiga's viability in a professional environment.

Myron Lieberman
Tempe, Arizona

HOTLINKS EDITIONS: READY FOR HOOKUP

To give PageStream something to link to, Soft-Logik produced HotLinks Editions, which includes HotLinks, the PageLiner text editor, and the BME bitmap editor. Soft-Logik has made the HotLinks standard available to developers, as well, so we may see other releases.

PageLiner is a straightforward text editor, with the ability to preserve PageStream formatting information such as styles, point sizes, and tags. Because the text used for editions is stored in the IFF DTXT format (an Interchange File Format standard for desktop-published

Continued on p. 58.

The ULTIMATE *Amiga*

BY LOU WALLACE



PHOTOGRAPHED BY EDWARD JUDICE

Just how much expansion power and add-on capability can you cram into one Amiga? AW's Senior Editor of Technology had a go at it recently and here's what he came up with.

ONE OF THE strong points of the Amiga has always been its ease of expandability. With features like auto-config hardware and an enormous linear address space that is the equal of many mainframe systems, we have always known that it is one computer system that you can expand to suit almost any need.

But late one night recently, in the room in my home that houses my own Amiga system, I heard a small voice taunting me in a kind of mocking whisper: "Yea, Lou, while you and many others have *talked* about this highly touted expansion potential, has anyone ever really tried to push the Amiga to the limit?" I decided to give it a try, and with the help of several Amiga third-party vendors, I came up with one reasonably powerful computer system.



To begin with, I chose the **A3000T** as the base for my expansion because it has lots of drive bays, a slew of expansion slots, and a large power supply. Of course, some of what went into the Tower could also have been used in the A3000 or A2000, but I would eventually have run into space and power limitations.

More Speed, More Memory, More Storage!

The first thing I wanted to do was add a faster processor. While the 25-MHz 68030 in the A3000T was nice, it didn't have the raw computing power I wanted. The obvious choice was a 68040, but which one? I started out with Progressive Peripherals' 28-MHz Mercury '040 card (which has 32 megabytes of 32-bit RAM on board). This is one impressive accelerator, but soon after I installed it, I received GVP's G-Force '040 card. This baby also operates at 28 MHz, but it has only 8MB of RAM. The RAM, however, is very high-speed 40-ns RAM.

Having to choose between slightly faster processing and more memory, I opted for the G-Force because speed was my primary concern. But then I received ***Progressive Peripherals***' new 33-MHz **Mercury** card (it actually clocks in at 35 MHz), which was also equipped with 32 megs of 32-bit RAM. That changed the equation again, so I replaced the CPU board once more, going with the fastest 68040 product.

Next I needed memory. My Tower already has 18 megs on the motherboard (16MB of 32-bit RAM and 2MB of chip RAM), plus I now had the 32 megs from the Mercury card, bringing the total to 50MB. Most people would have said that was enough, but by this time power-user syndrome had overtaken my body, and strange voices in my head were chanting: "More RAM! We need more RAM!"

Never one to ignore disembodied voices, I began to search for a suitable RAM card. There was really only one choice: ***Progressive***'s **Pro-RAM 64MB** Zorro III RAM card for the A3000/3000T. Plugging in one of those babies, I turned on the system and was pleased to see that I now had 114 megs of RAM. That seemed enough to play my favorite game of Stellar Space Asteroids, so I moved on to storage.

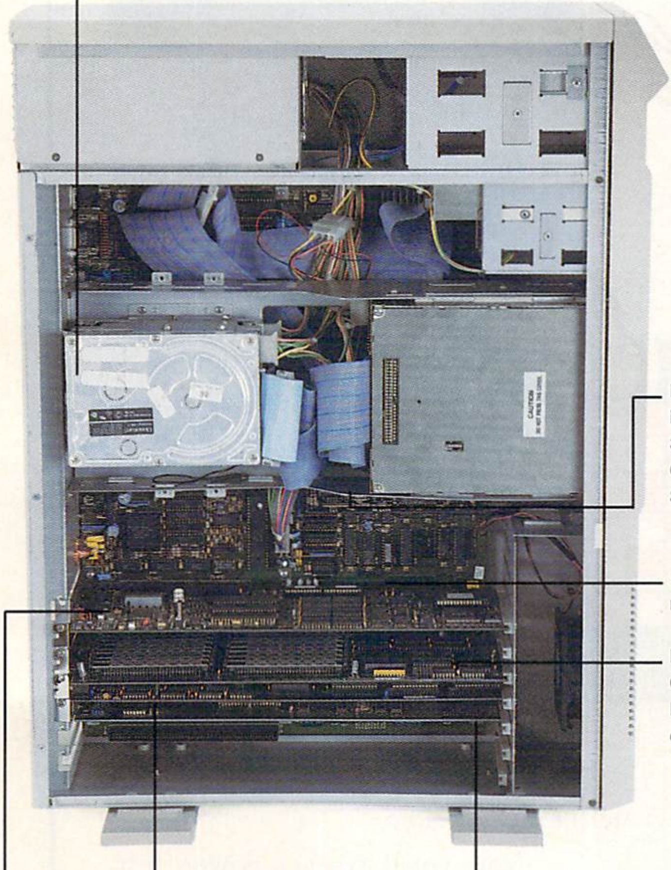
Starting off with just the standard 200MB Quantum, I quickly realized I needed more hard-disk capacity. While I could simply have gone for one of the large, full-height 5¼-inch gigabyte drives, I decided that I would rather spread the storage out over several drives. I opted for a 520MB 3½-inch ***Fujitsu* SCSI hard drive** and an 88MB ***SyQuest* removable-media drive**.

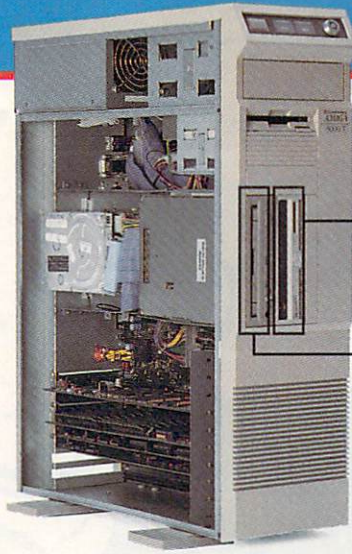
I gave a lot of thought to which removable media to use, and almost decided on one of the new flopticals; because they currently come only in 20MB formats, however, I went instead with the 88MB SyQuest. The SyQuest offers good disk performance, and I can just pop in a new cartridge when I need more storage.

While all this writable storage was impressive, I wanted access to the ever-increasing library of software and data found on CD-ROM. To gain this, I needed a drive and a CD-ROM file system. I opted for a ***Chinon* internal CD-ROM drive** and ***Canadian Prototype Replicas*' CDROM-FS** as the driver software. (And since no Amiga CD-ROM system is complete without the entire Fred Fish collection, I added ***HyperMedia Concepts*' Fred Fish CD-ROM**, which gives me more than 600 floppy-disks' worth of PD programs on a single disc.)

On to the Extras

Next on my agenda was the display card. While I like the Amiga's standard graphics, those darn voices kept screaming: "24 bit! 24 bit!" I took a long look at all the 24-bit cards for the Amiga (there are a lot of options) and settled on ***Great Valley Products*' IV24**. This multifunction card offers a full 24-bit display, RGB and composite genlock, a flicker-free display,





Ultimate Amiga: Vital Statistics

A3000T (18MB RAM, 200MB drive, 1960 Multisync)	$5255
PP&S 35-MHz/32MB Mercury 68040	5000
PP&S ProRAM with 64MB	4450
Fujitsu 520MB HD	1100
SyQuest 88MB removable	500
Chinon CD-ROM drive	350
CD-ROM-FS	50
HyperMedia Fred Fish CD-ROM	70
SunRize AD1012	595
ASDG Dual Serial Board	299
Supra FAXModem V.32bis	350
GVP IV24	2199
TOTAL	$20,218

picture in a picture, and a variety of support software.

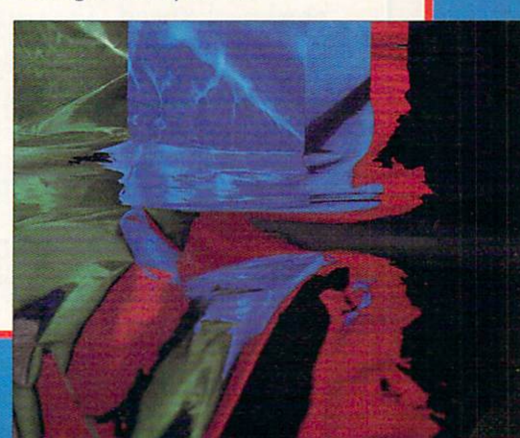
The voices started chattering about sound, so to shut them up I quickly installed ***SunRize Industries***' **AD1012** 12-bit digitizer. Currently, the AD1012 is the best audio digitizer available for the Amiga, and it is able to digitize sound at rates of 80,000 sps (samples per second). It can also digitize audio directly to hard disk, so sample size is limited only by the available storage space.

One of the things I always find I need more of is serial ports—one is never enough. I narrowed my choices to Commodore's A2232 multiport card and ***ASDG***'s **Dual Serial Board**. I decided on ASDG's card because it supports up to 115K baud and seems to be a bit more reliable than the CBM product.

Finally, for a modem I wanted a fast internal card, but currently the fastest internal Amiga modem is the Supra Modem 2400zi Plus—which just isn't fast enough. So I opted for ***Supra***'s external **FAXModem V.32bis** (not pictured), which offers transfer rates of 14,400 baud.

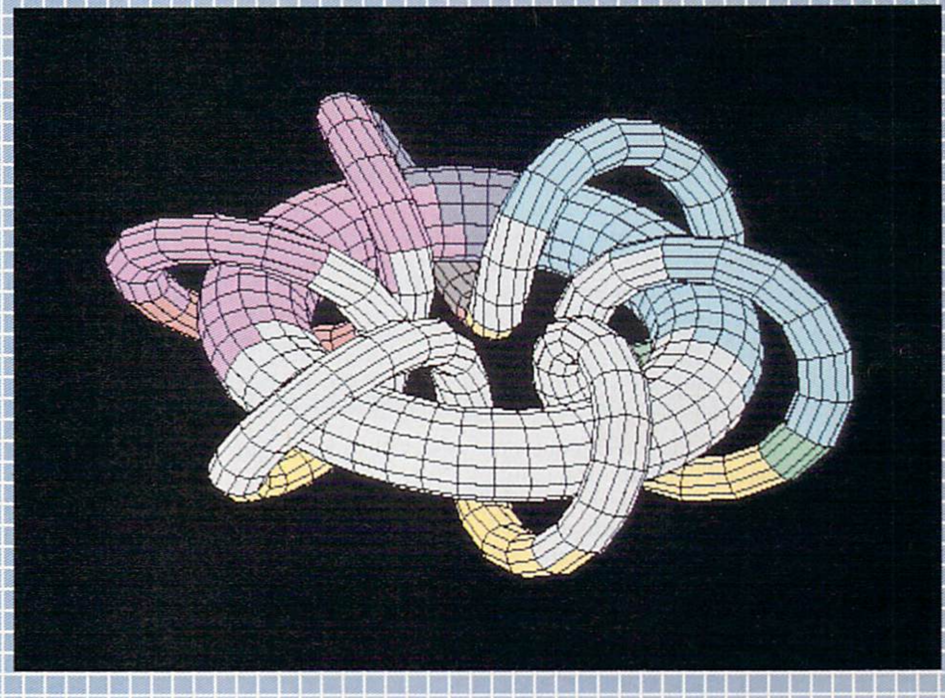
So is this really the *ultimate* Amiga? I like it pretty well, but those voices keep saying: "C'mon, Lou, you can do better than that! You've still got two drive bays, one Amiga slot, and two PC slots that are empty." Well, I could still add another 64-meg RAM card, a Bridgeboard or Mac card, and maybe even throw in a TBC card or two. Perhaps a streaming tape for backup could occupy that 5¼-inch bay, and, darn it, I really did want one of those neat flopticals!

Okay, enough; maybe I'll do this again next year and see what the Ultimate Amiga looks like then. But at the present time I want to put this mega-Amiga to work. Let's see now; what I have really always wanted to know was the answer to the ultimate question: What *is* the meaning of life, the universe, and everything? "Oh, Deep Thought..." ■



Math Spoken Here

Professional and would-be scientists: Maple V speaks your language. It's an algebra program that calculates, graphs, and opens many doors to Amiga users.



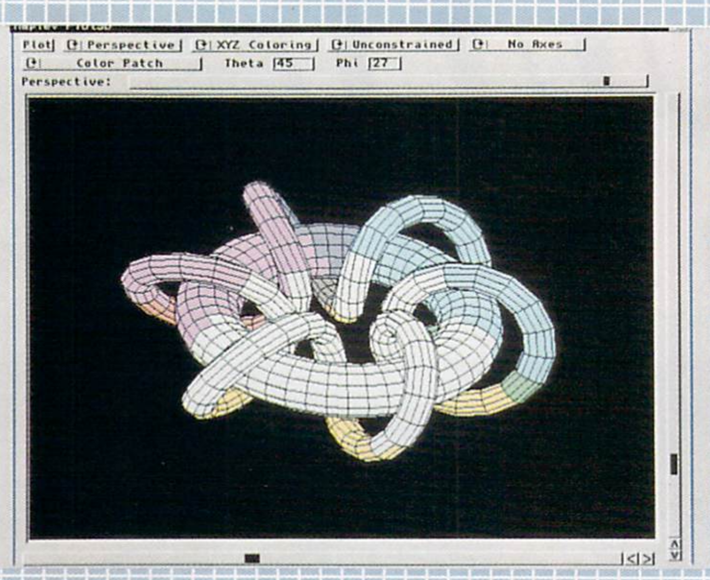
By Marvin Weinstein

While the Amiga has always been an ideal platform for preparing scientific papers, until recently it lacked software designed for serious computation. Now **Maple V**, a premier symbolic-math program ($450, ***Waterloo Maple Software***), goes a long way towards filling this void.

As a theoretical physicist, I find that a combination of Maple V, ***Radical Eye Software***'s **AmigaTeX** text-formatting program ($200), and a good, ARexx-capable drawing program such as **ProVector** ($299.95, ***Stylus***) provides everything I need in order to do a computation, write a ►

paper, and submit it for publication. A must for Amiga-using physicists, mathematicians, and engineers, Maple V can also be of value to teachers and students. In fact, the State University of New York at Albany offers an innovative math course built around Maple V running on Amiga 2000s and 2500s.

Symbolic-math software takes the drudgery out of doing analytic calculations, much as the hand calculator takes the drudgery out of numerical computations. With it, even the average person can command the mathematical technique once reserved to the highly trained engineer or scientist.



Maple V's 3-D graphics screen provides sliders at the right and bottom for rotating the object in three dimensions. The various gadgets are used to change the plot's characteristics.

Maple V does what is called algebraic manipulation, mathematical manipulation, or computer algebra. It computes equations and graphs them in two or three dimensions. Like other algebra software, Maple V is in part a language. Yet it is distinct from languages like C or Fortran in that it can manipulate expressions, parts of which are implicitly or explicitly left unevaluated. Thus, Maple V allows such expressions as

```
x := (a+b)^2
x := x + 11;
```

even if the variables a and b have not been assigned a value.

Good algebra software provides tools for expanding, simplifying, factoring, differentiating, integrating, and otherwise massaging user-defined expressions of this type. A sophisticated symbolic-math language must know about trigonometric functions, special functions like Bessel functions, linear algebra, and matrices. It should also be able to do known definite and indefinite integrals, arbitrary precision arithmetic, infinite sums, and, in general, make life simpler for someone doing lengthy analytic calculations. Ideally, it should also be user-friendly and fail-safe.

Throughout this article, I'll detail how Maple V approaches the ideal, but let me start by pointing out that its predecessors (all on nonAmiga platforms) had only a subset of these characteristics. When Maple V and its competitor Mathematica emerged in the 1980s, they added much more power, a better user interface, modern syntax for the programming language, and powerful graphing capabilities.

A revolution came when the creator of Mathematica realized that an algebra program of this caliber was not simply a computer-science curiosity, but had commercial value. Since then, the symbolic-computation group at the University of Waterloo has dug furiously for the "gold in them thar hills," and a healthy competition has developed between the two programs. Maple is the first to tap the Amiga market.

FOR THE SAKE OF COMPARISON...

Although Mathematica does not exist for the Amiga (versions of both programs exist for MS-DOS, Mac, NeXT, Sparc, and other RISC stations), it is Maple V's nearest competitor. My own and many of my colleagues' experience is that out of the box, Maple V is more powerful. Also, on a given platform, it runs faster and is more sparing of memory.

A cursory inspection of the *Maple V Library Reference Manual* (New York: Springer-Verlag) gives a feeling for the enormous repertoire of functions that are part of the standard Maple V distribution. This book, which reproduces the help files available on line, describes approximately 2000 functions. Besides all of the special functions, there are packages for linear algebra, statistical analysis, student calculus, combinatorics, differential forms, group theory, logic, simplex-linear optimization, groebner bases, number theory, Lie symmetries, Newman-Penrose formalism, Euclidean, analytic, and projective geometry, and so on.

The only difficulty with such an embarrassment of riches is that it is sometimes hard to know what you must use to solve a problem. I frequently begin writing a program only to find, hidden away under some unfamiliar name, a built-in function that can do the job.

This brings me to documentation, a place where Mathematica tops Maple V. There is no question that more varied documentation exists for Mathematica, especially at the introductory level. Besides the *Library Reference Manual*, the only Maple V books I am familiar with are *The Maple V Language Reference Manual* and *First Leaves, A Tutorial Introduction to Maple* (New York: Springer-Verlag). These books are helpful, but do not give a complete introduction to what Maple V can do.

While it is simple to get started with Maple V, learning to exploit all of its power can take a while. Fortunately, the program provides on-line help, and perhaps more important, most Maple functions are written in Maple's own programming language. This means that you can print the source code for these functions and study them to learn programming technique.

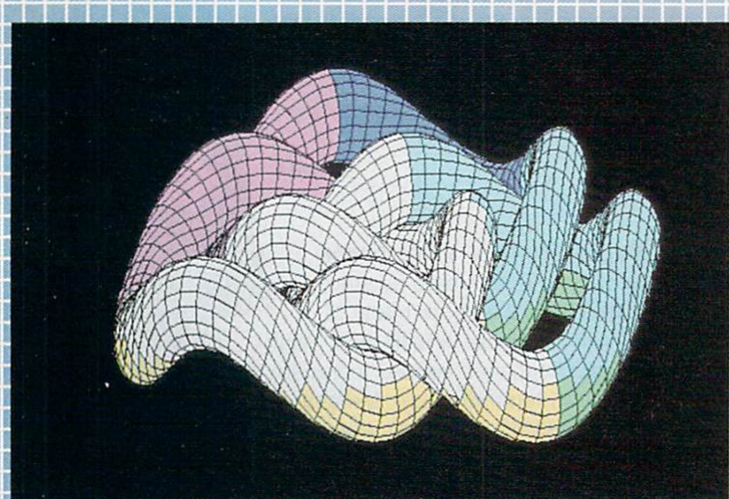
Although I maintain that Maple V is more powerful ►

than Mathematica, there are some things Mathematica does that Maple V does not. For example: The current version of Maple V does not, as Mathematica does, evaluate special functions for complex argument; Mathematica produces contour plots, whereas Maple V does not; and Mathematica's 3-D graphics use a lighting model that Maple V lacks. Furthermore, Mathematica's graphics capabilities are generally glitzier than Maple V's. The forthcoming Maple V Release 2, however, will correct most of these shortcomings.

How To Succeed

Understanding a problem and knowing how to recognize a wrong answer is still a prerequisite for success, because all symbolic math programs make mistakes. To be precise, there are circumstances in which each of these programs will give the wrong answer to what would appear to be a simple problem. For example, ask either Maple V or Mathematica to do the integral for the electric field inside a spherical shell of charge, and you will get the wrong answer. One reason for this is that these programs do not consistently choose branch-cuts for analytic functions. Another is that neither program allows you to specify if a variable is real or complex, or if one variable is always to be considered greater or smaller than another.

Surprisingly, an older, less sophisticated program called MACSYMA does provide such a calculus of assumptions, and it does give the correct result for this problem. While this shows there is no insuperable difficulty in providing such a facility, a major rewrite would be necessary to incorporate it into Maple V. I have been told that Waterloo Maple plans to introduce such a facility when it releases Maple V.2 later this year; however, it may not be possible to hook all of Maple's routines into it by that time.



These Borromean rings were distorted because they were plotted without the Constrained option. If any one ring is removed, the remaining two rings are not linked.

This by no means indicates that symbolic math programs are useless. Far from it! It just means that you must use them with the same degree of caution you would in doing a calculation by hand. There is no substitute for common sense and careful checking of limiting cases.

Interfaces

Maple V's algebra engine is separate from its user interface. This means the engine can be the same from platform to platform, while the user interface can change to utilize the facilities available. The Amiga version of Maple V runs in one of three ways: through its standard window interface (referred to as IRIS), from the command line of a shell (its CLI interface), or as an ARexx server.

Maple V's IRIS interface consists of an input and an output window. The input window has one menu with a few options and rudimentary line-editing capabilities. The output window has a scroll bar, allowing you to examine a result that has scrolled off-screen. Both windows support cutting and pasting.

Unfortunately, the Maple V program controls both the input and output windows directly, rather than spinning them off as separate handlers. Thus, if Maple V is chewing on a big expression, the input and output windows are dead, and you cannot scroll back to study a previous result until computation has ceased. There is no reason for this kind of behavior on a multitasking machine such as the Amiga. Fortunately, you can get around these limitations by exploiting Maple V's CLI interface.

You can launch Maple V from a shell using the -cli option. In this case, the program uses the CLI for all input and output, much as it does on a mainframe. While this might not seem like a virtue, it allows you to totally reconfigure the way Maple V works. For example, by combining WShell 2.0, ARexx, rexxarplib, TurboText and fifo-pipes, I have a version of Maple V with powers and abilities far beyond those provided by the IRIS interface. When I launch Maple V, I get something that looks similar to the IRIS interface except that by the grace of WShell, it offers programmable menus, a scroll bar (which stays active while Maple V computes), the ability to cut and paste part or all of a session, automatic saving of all output to a history file, and so on.

I can also load a file from a menu, or open a TurboText session, write a program, and—at a keystroke—send all or a selected part of the program to Maple V for processing. Obviously, I don't have the room in this article to explain how to do this, but if you would like a disk containing the relevant ARexx macros and a doc file that explains how everything works, send a floppy disk and a self-addressed, stamped disk mailer to: Maple V Program, c/o Barbara Gefvert, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458.

Unfortunately, a bug can bite when you launch Maple V from a shell using the -cli option: If you do not use the correct case, your machine will crash. Waterloo Maple Software claims that a fix for this is in the works. A more serious problem is that the CLI mode loses track of the screen used to display two-dimensional plots. This means that when you quit Maple V after having called the plot() function, the graphics screen ►



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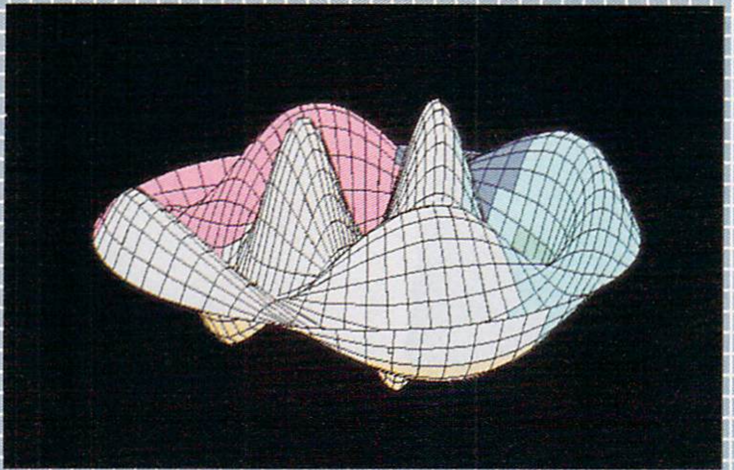
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will not close, and your machine crashes. Because the IRIS interface does not suffer from the problem, this has proven only a minor annoyance for me, but it is a bug that needs eradicating. Because two-dimensional plotting is being completely redone for Maple V Release 2, the problem should disappear in the next version. A similar problem arises with the plot3d() function, but it is neither as severe nor as reproducible.

Maple V also has an ARexx interface, but it is minimal. It is active only when Maple V runs in background mode without a user interface. Maple V does have a system() command to let you work around these limitations. Future releases should provide a continually active ARexx port that obviates the need to play with fifo-pipes in order to perform the magic discussed in the previous section.



Here is a plot of a vibrating drum surface. As with the Borromean rings plot, it was displayed on the 3-D graphics screen and then saved to an IFF file. The equation:

```
with(plots);

k := 11.61984117;

plot3d( [r*cos(t),r*sin(t),BesselJ(2,k*r)*cos(2*t)],r=0..1,t=0..2*π,
    grid=[30,60] ,orientation=[68,54] );
```

Plotting and Scheming

Maple V's graphics capabilities are impressive, and its user interface sports many Workbench 2.0 features. (Maple V runs only under AmigaDOS 2.0—not under earlier versions.) In particular, three-dimensional plots are displayed on a screen endowed with horizontal and vertical scroll bars and a gadget that lets you adjust the amount of perspective in the display. This allows you to plot a function and then interactively rotate the plot, change the plotting mode between wireframe, hidden-line removal, and color patch (colored in several ways), and reset the perspective without retyping any commands.

After you have the display just the way you want it, you can save the plot as an IFF or PostScript file. Currently, Maple V's Postscript plots, unlike IFF plots, do not contain color or shading information. The accompanying figures show some of the plots you can easily produce using Maple V's Plots module.

While I have run complex Maple V programs on a 3MB machine with little or no difficulty, big jobs and three-dimensional graphs that plot numerous points eat up a lot of memory. Although Maple V needs only 150K of stack and loads successfully on an A500 with 1MB of RAM, serious use of the program requires significantly more memory. Also, because the program takes up about 9MB of storage space, those without a hard disk will not be able to use it effectively. Scientists and engineers who plan to use Maple V for complex problems should consider an Amiga 3000 with extra RAM.

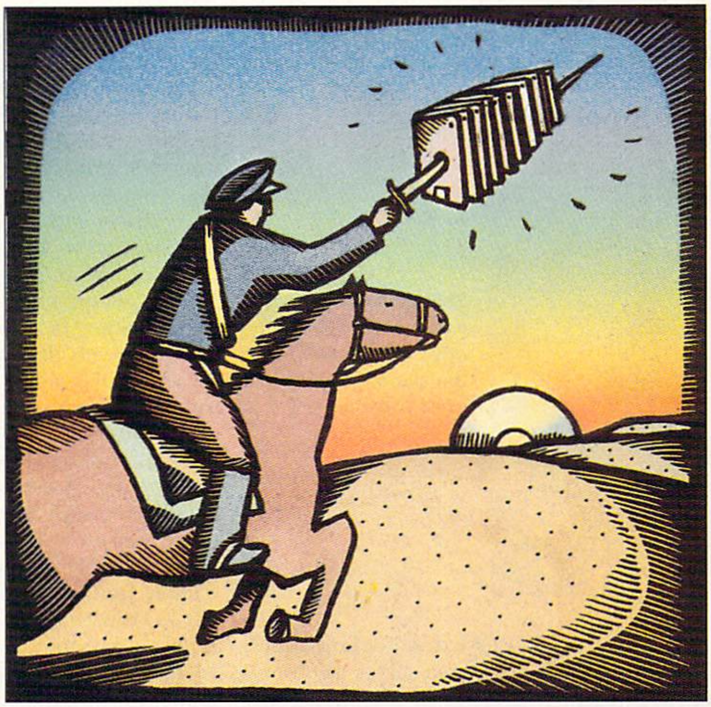
And, speaking of problems, Waterloo Maple Software provides extraordinary support. Not only can you get help with trouble encountered installing or running the program, but you can even get advice about a program you are having difficulty writing. All you have to do is call or send e-mail to the addresses listed in the manual. In addition, whenever someone reports a bug in the algebra engine that Waterloo can fix simply by rewriting a library routine, the fix is made and posted to the anonymous ftp site, daisy.waterloo.edu(129.97.140.58) over Internet. Connect to this machine and look in the Maple directory, and you will find not only library upgrades but all sorts of user-supplied packages that are ready for downloading.

You are not likely to find Maple V on your Amiga dealer's shelves; you should contact the company directly to buy it (e-mail: info@maplesoft.on.ca). Waterloo Maple Software provides educational discounts and site licenses at attractive rates. The single-unit academic price of $395 is not much of a discount from $450, but for sites with 25 machines, the price comes down to about $79 each, including a total of five manuals. In my opinion, you get more than you pay for.

Despite the bugs in the current release, Maple V is an extremely powerful and valuable new tool that positions the Amiga as a low-end scientific workstation. Beyond that, I see many opportunities for using Maple V with other Amiga programs in interesting ways. For example, by using Maple V to drive 3-D rendering and animation software, you could produce a scientific-presentation package of tremendous flexibility and might. Maple V opens more than just the obvious doors. ■

Marvin Weinstein, a theoretical physicist at the Stanford Linear Accelerator Center, works on nonperturbative methods for analyzing lattice field theories and spin systems. Dr. Weinstein has used Amigas since the early days of the A1000 and became involved with ARexx when it was just a gleam in Bill Hawes' eye. He has written extensively on using ARexx to customize work environments. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

The CHARGE *of the* CD *Brigade*



With 600 floppies' worth of storage capacity per disc, CD-ROM is galloping full speed ahead into the data breach. So take a forward observation post here as we show you how to mount a CD-ROM system on your Amiga: What you'll need, how to do it, and some of the benefits you'll reap.

BY JOHN FOUST

NOT SO LONG ago, the data-storage dilemma for many people was this: Do you really have enough data to make full use of the double-digit-megabyte capacity of your new hard drive? Now, the problem is quite the opposite, and more relevant questions are likely to be: Does your hard disk always seem too small? Does your Fred Fish disk collection consume half the space surrounding your Amiga? Is your addiction to data threatening your pocketbook?

Well, the next time you're about to go charging off into the vast Valley of Data armed only with a measly 40MB hard disk, consider adding a CD-ROM drive to your system. With more than 600 megabytes of storage capacity on each CD-ROM disc, you can field an army of Light Brigades to make sure you'll never again be outgunned or overmatched in battling your data.

CD-ROM easily allows you to store thousands of megabytes of files in compact, convenient fashion. With mega-collections like the Fish library on CD-ROM, your biggest problem might be in misplacing such a set under a single sheet of paper. Also ►

ILLUSTRATED BY RANDY LYHUS

not to be neglected is the fact that CD-ROMs deliver a lot of data for just a little cash.

So, what does it take to add CD-ROM capability to your system? The solution involves answering the following three questions: Where can you install the CD-ROM drive? Is your hard-disk controller compatible with CD-ROM? And finally (in terms of the type of system you choose), do you need a Ferrari or a Yugo? *(To locate vendors of products mentioned in this article, consult the "Manufacturers'/Distributors' Addresses" list on p. 106.)*

Many Ports in a Storm

If you have an unexpanded Amiga 500 with at least one megabyte of chip RAM, the solution is fairly easy. ***Commodore*** plans to release the **A570 CDTV Adapter**, which installs directly into the A500's expansion port.



This CDX-431 Chinon external CD-ROM drive is included in the system bundle from Vertical.

It provides you with a CD-ROM drive—compatible with Commodore's CDTV—and also serves as an expansion chassis through which you can add up to 2MB of chip RAM and a 2.5-inch SCSI hard drive. If your A500's expansion port is already in use, however, you will have to remove your existing external expansion chassis in order to use the A570. (For more information on the A570, see "O Say Can You CD?," Jul. '92, p. 24.)

If that option is not attractive, consider an external CD-ROM drive from a third-party manufacturer. If you have a SCSI-compatible hard-disk controller, then use it to connect your drive. (All SCSI adapter cards include a connector for adding external devices.) This method works, of course, with any Amiga model.

If you have an Amiga 2000, you can install an internal CD-ROM drive in the 5¼-inch drive bay. If another device occupies that bay, choose an external CD-ROM drive. All Amiga 3000 systems use SCSI hard disks, but they do not have the 5¼-inch drive bay, so an external drive is the only solution.

File-System Driver Software

Most critical in adding a CD-ROM drive is the driver software that links it to the operating system. CD-ROM compatibility is not built into AmigaDOS. CD-ROM file-system drivers are currently available from ***Xetec***, ***Canadian Prototype Replicas*** (CDROM-FS), and ***Asimware Innovations*** (AsimCDFS). This "file-system" driver software fosters cooperation among AmigaDOS, your hard-disk adapter, and the CD-ROM drive—making the drive act like any other hard-disk drive.

Commodore has defined a protocol called "SCSI direct" for sending the special commands to devices such as tape drives and CD-ROM drives. If your hard-disk adapter supports "SCSI direct," then it is probably compatible with CD-ROM driver software. If you're not sure, check with the manufacturer: You may need an upgrade in software or in ROM.

If you have an Amiga 1000, the chances of such support could be slim. You may have a SCSI hard disk, but it may not be compatible with any CD-ROM driver software. Newer SCSI adapters for the A1000 can solve the problem.

A CD-ROM disc contains files and directories just like a hard disk, except that the files are stored using a standard called ISO-9660. The CD-ROM driver software translates the ISO-9660 file system so that it appears to be an AmigaDOS file system. (You may be wondering about the High Sierra CD-ROM format. Yes, it was an early version of the ISO-9660 format, and every driver supports it.)

Almost every CD-ROM in the world uses the ISO-9660 format. In the case of discs that you wish to be IBM PC-compatible, you must restrict filenames to eight characters, a dot, and a three-character extension, but such discs are still readable on all systems. ISO-9660 also allows longer, Amiga-like filenames, although they must be uppercase. Such discs work fine on the Amiga, Mac, and Unix-based machines. CDTV discs also use extended filenames.

Some Macintosh-oriented discs use minimal ISO-9660 formatting, but store the bulk of the data in little more than a copy of a Mac hard disk, using the Mac's Hierarchical File System (HFS). These discs are not accessible from a PC. When used with some of the latest CD-ROM drivers, however, they are accessible from the Amiga. Of course, the files must contain data that can be understood by an Amiga program, and no Mac program can execute directly on the Amiga without an emulator such as **A-Max II** ($249.95, ***ReadySoft***).

Selecting a Drive

While answering the third of our three questions can be a bit more involved, remember that choosing a CD-ROM drive is very much like selecting another hard drive. All CD-ROM drives have the same data capacity, but vary in speed and price. If you balance features against what you can afford, you should do just fine.

Like choosing a hard disk, you can buy a packaged system that is ready to go right out of the box, or you can personalize your system with individual components and a custom arrangement. ***Xetec*** offers several CD-ROM bundles, including both internal and external, and ranging from individual components to complete systems. The company provides an external Chinon CD-ROM drive, driver software, and two CD-ROMs containing the Fish collection for $599. At the opposite extreme, for the do-it-yourself enthusiast, it sells its driver software and the two CD-ROMs for $50.

Xetec's CD-ROM software works with any "SCSI-direct" adapter, including its own adapters that are available for every model of Amiga. Beyond support for ISO-9660 discs, the Xetec software also understands Macintosh HFS discs and emulates Commodore's CDTV to a great extent. ►

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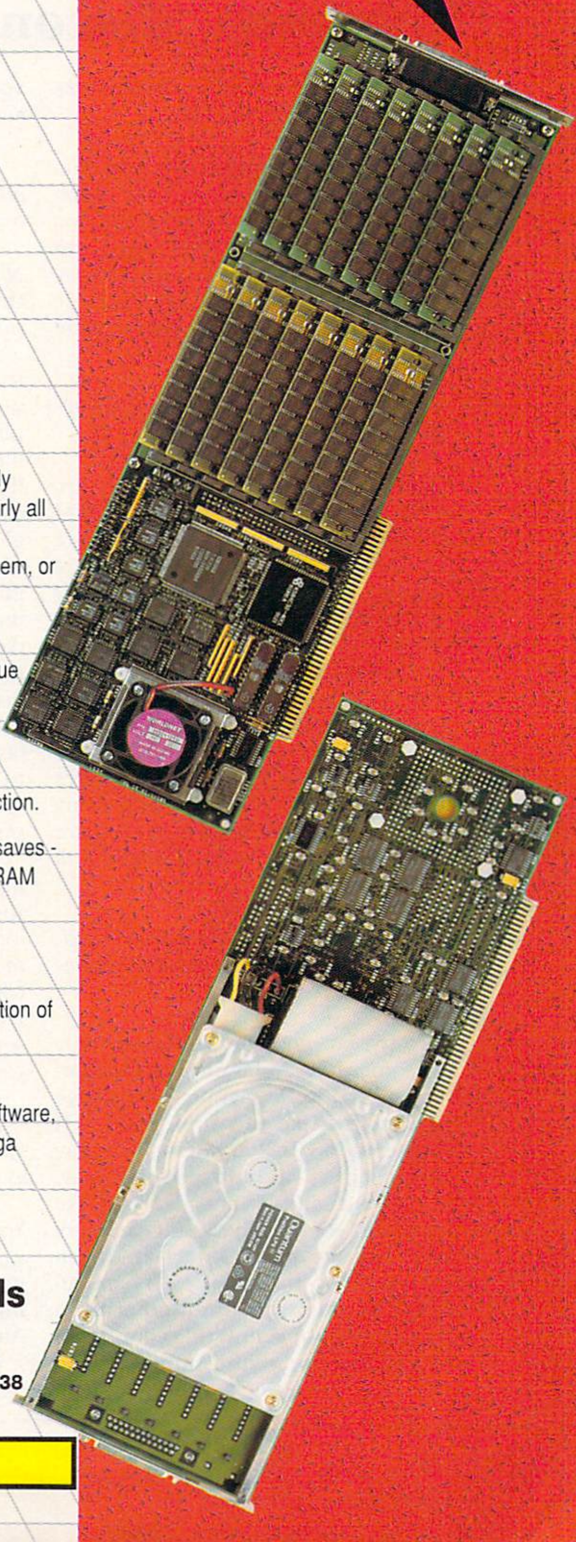
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Circle 150 on Reader Service card.

A US distributor, ***Vertical***, offers a similar bundle that's based on Canadian Prototype Replica's file-system driver. It includes a Chinon CD-ROM drive, the CD-ROM-FS driver software, and HyperMedia Concept's Fred Fish collection on one CD-ROM ($799 for an external unit, or $699 for an internal drive). The CD-ROM-FS software is available separately for $49.95.

If you have an A2000 and your 5¼-inch drive bay is empty, you can fill it with an internal CD-ROM drive. Like an add-on SCSI hard disk, an internal CD-ROM drive needs two internal connections: a four-pin power supply connection and a 50-pin ribbon cable for the SCSI data. If you have already used all the power connections in your A2000, purchase a "Y" power adapter to gain an extra connector. Like an extension cord, it turns one plug into two. If your Amiga dealer does not carry it, you can buy this adapter at any PC computer store.

Internal CD-ROM drives are typically less expensive than external drives. The price of an external drive nec- ►

Common Misconceptions About CD-ROM

1. You can add to or otherwise change the contents of a CD-ROM disc.

Unfortunately, you can only read data from CD-ROMs, not write to them. They hold megabytes of data, but you can change none of it. You cannot add your own files to any of the directories. If the publisher of the CD-ROM made a mistake in the data, it will be there permanently.

2. CD-ROM drives are like magneto-optical (MO) drives, right?

Wrong. Magneto-optical drives are much more expensive than CD-ROM drives. They hold comparable amounts of data, but they can be changed again and again, like a floppy or a hard disk. Typical configurations are the 128-megabyte format on 3½-inch media and the 600-megabyte format on 5¼-inch discs. The 128-megabyte MO drives cost about $1900 for the drive alone, and new discs are $70 each. The good news is that MO drives use the SCSI interface and act like any other Amiga hard drive. They require no special software—just a big chunk of cash.

3. You can use a CD-ROM drive to capture perfect digital samples from your compact-disc music collection.

Nice try, but no again. Although they use somewhat similar mechanisms, audio and CD-ROM manufacturers have agreed to make this impossible. Of course, most CD-ROM drives can play compact discs. You can feed the music to a sound sampler and record it like any other sound. The results are very good because of the direct link from the player to the sampler. These results, however, are no different from those you get by connecting your stereo to the sampler; you've simply turned your CD-ROM drive into a very expensive boom box.

4. If CD-ROM drives are so similar to audio compact-disc players, then they must cost about the same.

No; CD-ROM drives cost more, and the misconception is related to the point made above.

First, the mechanisms and electronics of CD-ROM drives must be much more precise than audio compact-disc players. Both audio and data discs store data in purely digital form, just as a floppy disk does. All compact discs include forms of error correction to help gloss over the inevitable errors from nicks, scratches, and manufacturing glitches. By storing mathematically redundant copies along with the original data, the circuitry can restore a limited number of lost bits. If the error is too great, data is lost. An audio disc can suffer a tremendous number of errors before the problem becomes apparent to your ears, but these same sorts of errors are unacceptable for the perfect reproductions required by computers.

Second, audio-disc players do nothing but endlessly transmit data to the speakers of your stereo in a linear fashion. A CD-ROM drive involves much more complex logic in fetching and retrieving only the data you need. A CD-ROM drive can seek from "song to song" or "file to file" much faster than your home deck.

5. CD-ROM drives for the IBM PC (or the Macintosh) should cost about the same as those for the Amiga.

You may be confused by the low prices for drives in the IBM PC market. Some manufacturers offer complete systems for less than $400, but a system for the Amiga might cost twice that.

On the PC, SCSI is not very popular. Instead of SCSI, these CD-ROM drives use proprietary interfaces that transfer data to a custom PC card. Not needing full SCSI implementation, these manufacturers can offer a lower price.

If you do find a drive that uses a SCSI interface, keep in mind that you still need to buy Amiga-specific CD-ROM file-system software. Many PC-specific CD-ROM bundles (and Mac ones, too) include sample CD-ROM discs. Unless the data is in a format that is usable on the Amiga, these discs will be useless to you. Very often these discs require running a program to access the data on the disc, and the program can execute only on the PC or the Mac, not on the Amiga.

If you enjoy the challenges of emulation, you can run a PC-specific CD-ROM drive on your Bridgeboard. Most likely, the custom card will work when connected to the Bridgeboard. You can save pictures or files to the PC disk and then move them to the Amiga side.

In the Macintosh arena, you can use your CD-ROM drive under Macintosh emulation via ReadySoft's A-Max II. Remember, however, that you will also need to run any special CD-ROM driver software for the Macintosh. If you bought a CD-ROM drive from a Macintosh vendor, the software is probably included without charge.

Finally, although the PC generally does not use SCSI to control disk drives, you can purchase a PC SCSI adapter card for between $150 and $250. Be sure to get the necessary driver software, which might be an additional charge. While this may save you money, be careful, because the software could include as many as three layers, each a separate program: a SCSI driver, a CD-ROM driver, and the Microsoft CD-ROM Extensions, a standard way of adding CD-ROMs to MS-DOS. In short, installation could be an adventure. —***JF*** □

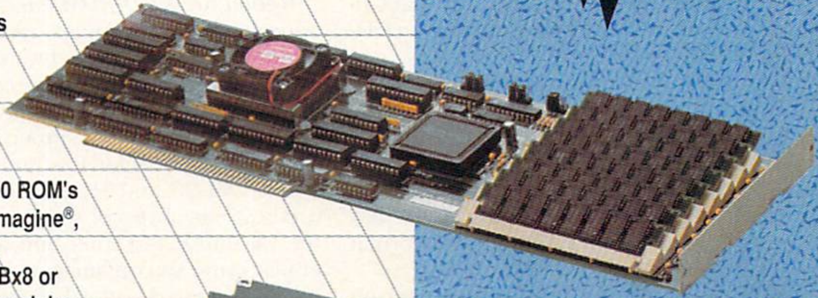
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040

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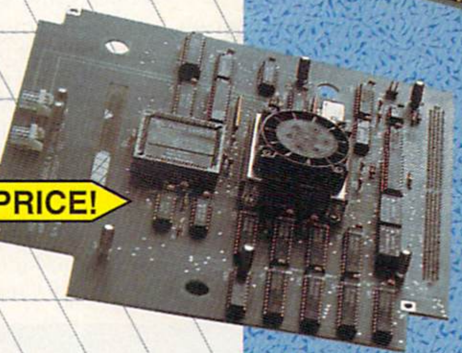
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essarily includes the cost of the case, a separate power supply, internal and external cables, lights, switches, and all the extra connectors. An external, self-powered CD-ROM system does not burden your Amiga's power supply or exacerbate internal heat problems. (If you're wondering about the difference in price between Amiga CD-ROM drives and IBM-PC drives, see the sidebar "Common Misconceptions About CD-ROM.")

One last thing you ought to keep in mind here is that whether the drive is internal or external, it had better be reasonably fast. In general, CD-ROM drives are much slower than hard disks. While a hard disk might take as little as 10 to 30 milliseconds to access data, a CD-ROM might take 350 milliseconds to find a certain spot on a disc. But 350 milliseconds is still a comfortable speed, and as long as you stay away from drives with access times of more than 500 milliseconds, you should be okay. Some drives are as slow as ►

CD-ROM Titles: An Update

ONCE YOU HAVE your new drive installed, disc publishers stand ready to assist you, eager to shovel more data into your Amiga. In a previous article on CD-ROM titles ("Plunging into CD-ROM," Mar. '92, p. 49), I covered a wide array of discs available. This sidebar describes some titles that have appeared over the last five or six months.

HyperMedia Concepts continues to update its **Fred Fish Collection** on CD-ROM, priced at $74.95. Every four months, the company publishes a new edition that encompasses the entire Fish collection. The new disc is an inexpensive upgrade ($29.95; subscriptions available) for registered owners. Besides the standard version, HyperMedia puts out another in a compressed format suitable for use on BBSs.

According to company spokesperson Chris Henry, HyperMedia's next CD-ROM project will be a collection of Amiga art and animations. Henry calls it "an open gallery with 630 square megabytes of open space. You can cut it up and display your art any way you want." He is seeking submissions of the large, disk-consuming animations that rarely circulate on floppies or BBSs.

Texture City has recently released its **Pro-100** collection of texture maps and scanned backdrop images on CD-ROM. Each 24-bit color image is stored in four formats, including IFF, at 752 by 480 pixels (not-so-coincidentally the resolution of NewTek's Video Toaster). Priced at $199.95, the disc comprises 100 images, including colored marble tiles, metals, landscapes, and textiles.

Walnut Creek CD-ROM offers several appealing discs for Amiga users at less than $40. Much of its software comes from archive sites on Internet. Its **Source Code** disc features archives from the "comp.sources" news group, including 36 megabytes for the Amiga (volumes 2, 89, 90, and 91), as well as hundreds of megabytes of source code for the Macintosh, PC, Unix, Sun, and other platforms. You can imagine how long it would take to download 36 megabytes using a 2400-baud modem!

Like many other discs, this one conforms to the MS-DOS conventions for filenames and extensions. To circumvent this inane limitation, there is on each directory of the disc a file containing true Unix-style names. Unix, the Mac, and the Amiga allow for much longer and more flexible filenames.

Walnut Creek also sells an Amiga-specific disc. In April 1992, one of the largest Amiga-related archive sites on Internet closed its doors. Before the NASA computer known as ab20 slammed shut, Walnut Creek took a "snapshot" and stored it on a CD-ROM. You can own these 2400 files for $24.95.

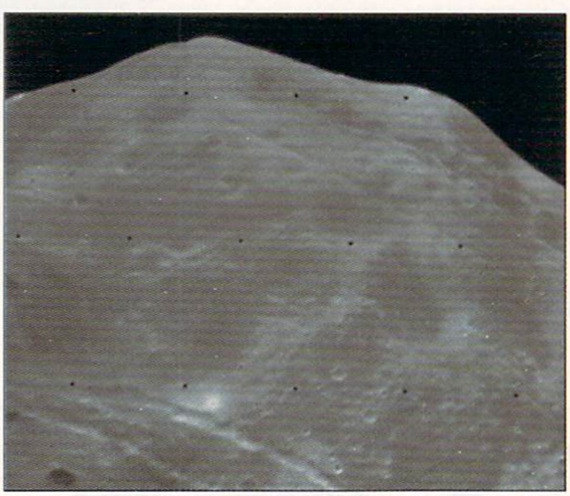
Walnut Creek's **X11R5** disc contains the entire X Window Release 5 source code, as well as a snapshot of the entire GNU "Gnu's Not Unix" source library, including a C++ compiler, a software PostScript interpreter, editors, and much more—all for $39.95.

Also for $39.95 you can get Walnut Creek's **Desktop Library** disc, which includes over 1000 books in ASCII format. It provides you with the complete works of Shakespeare, ancient Greek tragedies, the works of Virgil, Milton, Mark Twain, Jules Verne, and much more.

The US Government continues to release more data on CD-ROM, mostly of an astrophysical nature. The ***National Space Science Data Center*** at the Goddard Space Flight Center in Maryland is the clearinghouse for these discs. You can write for a complete catalog or obtain a list in electronic form by sending a message to 'request@nssdc.gsfc.nasa.gov' on Internet. (You can also send Internet mail through CompuServe Easyplex mail. Just prefix that address with ">INTERNET:".)

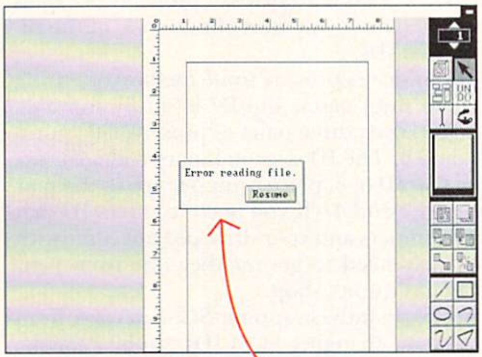
NSSDC discs include most of the space-related discs mentioned in my previous article, as well as new ones that have appeared since then, such as the Viking Orbiter images of Mars. The charge for the first disc in a data set is $20. Subsequent discs are $6, plus $2.50 shipping and handling.

Both *ASDG*'s **Art Department Professional** and ***Black Belt Systems'* ImageMaster** now support the FITS image format used on these discs. In addition, the latest versions of CD-ROM driver software support the nonstandard 512-byte block sizes on some early NASA discs. *—JF* □



Martian moon Phobos—from the new NSSAC CD-ROM featuring the Viking Orbiter images of Mars.

ProPage: "Error Reading File"



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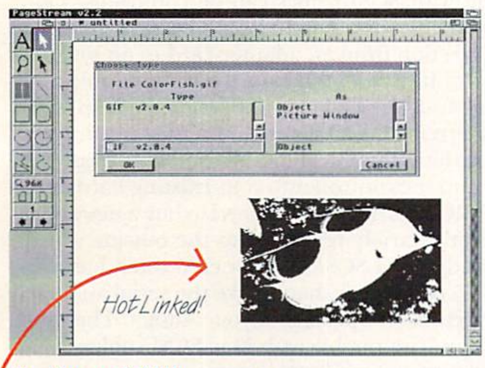
There's more to graphics than just IFF

Professional Page 3.0 and PageStream 2.2 both can import IFF bitmap pictures. But let's face it—in the real world, IFF pictures are not that readily available. Unless your desktop publisher can read GIF, TIFF, PCX, IMG and MacPaint pictures, you are missing out on the vast selection of commercial and public domain graphics.

When you try to import a GIF or TIFF picture into ProPage, you are faced with the "Error Reading File" message. To use other graphic formats with ProPage, you must acquire an array of conversion utilities.

File formats are something you shouldn't have to worry about. Your desktop publisher should do the work for you.

PageStream: No Problem!



HotLinked!

PageStream 2.2 HL

PageStream 2.2: More formats, More flexibility

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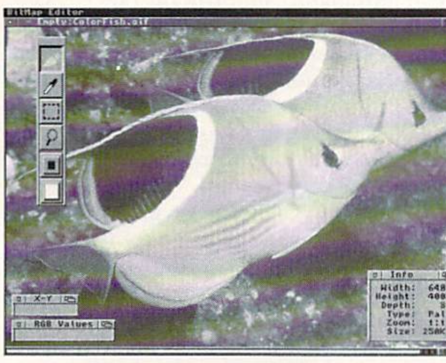
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Of course, PageStream also supports more vector graphic, PostScript and text import options than any other Amiga desktop publisher.

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The best news is that all of this power is affordable. HotLinks Editions combines HotLinks, BME and PageLiner for only $99.95. More HotLinks programs are on the way from several Amiga developers.

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1500 milliseconds—a full one and one-half seconds of access time.

Custom Systems and Extras

For a variety of reasons, you may want to consider assembling the system yourself. No more difficult than adding a hard disk, a custom CD-ROM system can be pieced together fairly easily. Because CD-ROM drives are now commodity computer parts, it is not hard to find equipment that works with an Amiga. By buying individual components from different manufacturers, you may be able to assemble a superior system—and save some money in the bargain.

Although in some cases you may not save any money by going the custom route, your custom setup will not limit you to adding only one SCSI device to the box. Cases are available that hold one, two, or four 5¼-inch devices. In addition to the CD-ROM drive, you could then install other SCSI devices, such as a hard drive, a removable-media drive like a SyQuest, a tape drive for backups, or a magneto-optical drive for holding frame stores.

To buy the pieces via mail order, you should look first in one of the Macintosh magazines. All CD-ROM drives sold in the Mac market use the SCSI interface. Publications such as *MacWorld* or *MacWeek* contain the most up-to-date ads from companies that offer both internal and external CD-ROM drives.

One final point to consider about buying a CD-ROM drive is this: Whether you choose an internal or external drive, a packaged bundle, or the components for a custom system, do a little comparison shopping when it comes to the extra features offered in today's drives.

For instance, does the drive include the cables you will need? Some companies charge extra; others do not. Also, if you have no interest in Mac CD-ROM driver software, be sure it's not a hidden charge. Does the drive have a power indicator or an LED that blinks when reading data? Does the drive have a self-cleaning lens for the laser beam that scans the disc?

Most drives use "caddies," a case that holds each disc before it slides into the drive. When you order a drive, consider picking up a few extra caddies. It's very convenient to keep frequently-used CDs in a caddy.

Most CD-ROM drives also play audio compact discs, and some "data" discs include musical tracks that you can play under computer control. Many driver-software packages include a Workbench tool that acts like the front panel of your CD player, and many drives include a front-panel volume control, a headphone jack, or even rear-panel RCA phono plugs.

Many CD-ROM drive owners discover that they spend more time playing audio discs than reading data discs. Some drive manufacturers recognize this, and they include more prominent audio and track controls and even infrared remote controls with their equipment.

Working With SCSI

Using a SCSI adapter card to connect a CD-ROM drive to your system can involve you in some tricky operations. Here are some pointers to keep in mind that relate specifically to SCSI ID and to using SCSI cables.

When installing a CD-ROM drive, you must set the SCSI ID of the drive. Every SCSI device has an ID, a number from 0 to 7. (The SCSI bus can support only up to eight devices.) The controller card in your Amiga occupies one of those IDs, usually ID 7. If you have already installed a SCSI hard drive, it probably occupies SCSI ID 0. Therefore, you must choose one of the remaining unused IDs.

All CD-ROM drives provide some method of setting a SCSI ID. In most cases, the ID is set by movable jumpers placed over three pairs of pins, usually numbered 1, 2, and 4. The ID is set in binary code. For example, to set an ID of 5, place a jumper across the pair of pins labeled 1 and 4. (If you need to set an ID that requires two jumpers and your drive did not come with spares, you may need to get another one from your dealer or an electronics shop.)

If you are constantly swapping SCSI devices from system to system, changing SCSI IDs can be a hassle. Make sure you know the method used by your prospective drive. The most painful procedure involves swapping jumpers inside the case of the drive. The next most complicated way involves manipulating an exposed row of DIP switches. Using a rotary switch is far easier, but the simplest method of all is the push-button, where a tiny digit is displayed in a window as each finger-press advances the ID.

Working with SCSI cables can be confusing. They come in three flavors. The first is the inside-the-computer connection from an adapter card to an internal SCSI device. It uses a 50-conductor ribbon cable with a wide, flat 50-hole header at both ends. If you plan to add an internal CD-ROM drive, you may need a new header for the ribbon. If the cable is not long enough to reach from the controller to your existing hard drive to the CD-ROM drive, you will need to buy a new cable.

The second variety reaches into the outside world. The back edge of a SCSI adapter card often has a female DB-25 connector, shaped like the serial and parallel connectors on the back of your Amiga. This connection is pin-compatible with Mac SCSI cables.

The third type is a 50-pin Centronics connector, a large D-shaped connector much like the one found on the back of some dot-matrix printers. Most external CD-ROM drives have two 50-pin Centronics connectors on the back for the SCSI cable. To add a second external SCSI device, you need a Centronics-to-Centronics cable.

Depending on your SCSI adapter, you may or may not need a SCSI terminator. Although the official SCSI spec recommends a terminating resistor pack on the last device in the SCSI chain, you may discover that you need to remove termination from the last device. Termination normally improves the electrical characteristics of the SCSI bus, but termination on the Amiga is more of an art than a science. Contact the maker of your SCSI adapter for the last word.

For external drives with Centronics-type connectors, you can get a terminator with the same connector for about $15. For internal drives, the terminator resistors are often slim electronic packs with many pins, usually located not far from the 50-pin ribbon cable. The documentation for the drive should confirm their location. Although they may look soldered to the circuit board, they can be pulled out without damage. ■

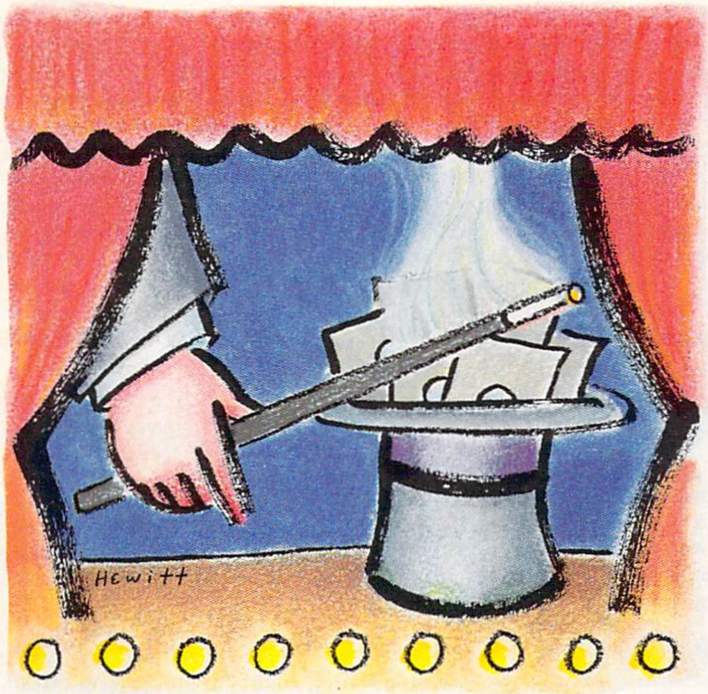
John Foust, president of Syndesis Corp., writes for a number of computer publications. His CD-ROM drive serves his PC and Mac, as well as his Amiga. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

"BIG 3" UPGRADES—PART III: DATA STORAGE

Hard Acts to Follow

In Part III of his "essential upgrades" series, our hardware Houdini outlines hard-drive and other mass-storage strategies—along with recommendations and purchasing advice—to make your data-storage dilemma disappear.

By Sheldon Leemon



A couple of years ago, a hard drive was a luxury that few Amiga owners could afford. A combination of decreasing prices and increasing file sizes, however, has made hard-drive ownership a much more practical—and necessary—proposition. People who used to think that a second floppy drive was the ultimate in convenience have lately been wondering whether 50 megabytes is large enough, whether 100MB might be a better place to start, or whether more advanced mass-storage technologies might be a wiser investment.

An increased demand for hard drives has resulted in a wider selection of mass-storage products than ever before. Not only that, but today's shopper must make choices based on a number of other considerations: Is it desirable to have an internal or external unit? A SCSI or an IDE controller? Fixed or removable media? A plain old hard drive or a combination product that also offers memory expansion and maybe even accelerated processing?

This profusion of choices, however, need not result in confusion. Armed with some basic information about the different types of drives available, you should be able to select the one that's right for your needs. *(For information on contacting the vendors of products mentioned in this article, consult the "Manufacturers'/Distributors' Addresses" list on p. 106.)*

A hard-drive system consists of three components: the drive mechanism, the hardware interface that connects the drive to the Amiga, and the device-driver software that allows the Amiga to use the drive for storage. Two of these components, the hardware interface and the driver software, are Amiga-specific and are usually supplied together by a single manufacturer. The third component, the drive mechanism itself, is more generic because the same physical units can be adapted for use on several types of computers.

DRIVE MECHANISMS

The most common type of hard-drive mechanism is the fixed-platter Winchester variety. These airtight units contain one or more platters of plated magnetic me- ►

ILLUSTRATED BY MARGARET HEWITT

dia, with read/write heads for each platter. Older drives used the same bulky 5¼-inch case as the original IBM PC disk drives, but most current drives use the same size case as the Amiga's 3½-inch disk drive. Capacities of 50–100MB are currently the most common, but newer drives pack up to one gigabyte (1024 megabytes) in a single 3½-inch package.

Smaller 2½-inch drives, originally designed for laptop computers, have also become more common (Commodore reportedly plans to put one inside its tiny A600HD computer), and some companies have announced hard drives as small as 1.3 inches in size. Bare drive mechanisms can be mounted internally, using the same drive bays as 3½-inch or 5¼-inch floppies, or attached directly to the interface card. An external drive is simply an internal drive that is housed in a separate case, with its own power supply. Although an internal drive offers a neater solution, an external one is more portable and can be shared between systems.

Smaller drives are not only easier to install internally, but as a general rule they are also faster because the heads have a shorter distance to travel. The measurement most often used to calibrate hard-drive speeds is the "average seek time," which is measured in milliseconds (the lower the number, the better). Older drives have seek times as high as 80 milliseconds, while most current drives have a rating of 20 or less.

Using a faster drive mechanism usually results in faster load and save times, but raw drive speed is not the only factor in overall performance. The interface hardware and software is crucial—the same drive mechanism can deliver up to ten times faster performance with a fast interface than with a slow one.

In addition to size, capacity, and speed, hard drives are identified by the type of hardware interface they use. We'll examine interfaces more closely further on, but there are a few points that deserve mention here.

The common interface standards are ST-506, IDE, and SCSI. ST-506 drives, the type first used on the IBM PC, are "dumb" devices controlled by external cards that need to be configured for a particular drive type (number of heads, number of sectors per track, and number of tracks). Because these drives are relatively slow and need a fairly complex controller that can handle only two drives, few Amiga interfaces support ST-506 drives (they are even becoming rare in the IBM world). ►

Hard Drive Checklist

WHEN SHOPPING FOR a hard drive, there are a number of different factors you should consider. Performance may be important, but don't forget about reliability, compatability, expandability, and so on. Here are some questions to keep in mind:

✔ *How easy is the hard drive to install?* The best models are simple to attach and are ready to operate as soon as you plug them in. You may save some money by buying the drive mechanism separately (or using one you already have) and hooking it up to an interface, but you'll pay for these savings through greater time, trouble, and worry about compatibility and warranties. Remember that ease of installation includes software as well as hardware. Look for a system with easy-to-use partitioning and formatting software.

✔ *What mounting options does this system provide?* For A2000 interfaces, the option to mount the drive directly to the interface card provides the most flexibility because it leaves the internal drive bays free for additional drives. The most popular A500 systems are small plug-in boxes that extend the width of the computer and whose styling matches that of the A500 itself.

✔ *Is the device driver software Rigid Disk Block compatible?* Adherence to this standard makes it easy to read data from a drive formatted with one type of interface when you are using an interface from a different manufacturer. This is particularly handy for external or portable drives.

✔ *Does the device-driver support a wide assortment of devices?* A SCSI interface that supports Commodore's SCSI Direct command set should be able to communicate with such devices as tape drives, CD-ROMs, and even optical scanners that use a SCSI interface. Inquire as to what kinds of devices have been used successfully with a particular interface, particularly tape-backup and removable-media drives. If a manufacturer claims to support multiple hosts for SCSI networking, ask what software support is available for such networking.

✔ *How often is the driver software updated?* Most interfaces will exhibit compatibility problems from time to time as new software and hardware packages are released. A responsive manufacturer will issue periodic updates to the driver software, both to address such compatibility issues and to increase performance.

✔ *What other functions are included with the interface hardware?* Many hard-drive interfaces also include functions such as memory expansion. Try to determine if the interface is expandable to a full 8MB, and what the memory for such expansion will cost. Memory expansion is especially important for A500 interfaces because most RAM cards take up the machine's only available expansion port.

✔ *How expandable is the system?* SCSI interfaces will support up to seven drives, and most include an external connector for hooking up external drives. IDE interfaces support only two drives, but if you do not need the expansion capabilities, you may find them less expensive.

✔ *What is the best size drive to buy?* Older 20MB drives have become somewhat scarce; currently, entry-level systems with 50MB are the most affordable. You will find, however, that the incremental cost for a 100MB drive is small enough that you can double your storage without coming close to doubling your cost. Although large (300–1200MB) drives can get pretty expensive, the cost per megabyte is actually much less than with smaller drives.

✔ *How serviceable is the unit?* Can your local dealer fix the drive if something goes wrong, or will he replace it under warranty? Ask questions about how well the manufacturer responds to customer complaints, how long the company has been in business, and so forth. The last thing you want is to buy the cheapest system you can find and then have problems getting service or updates.

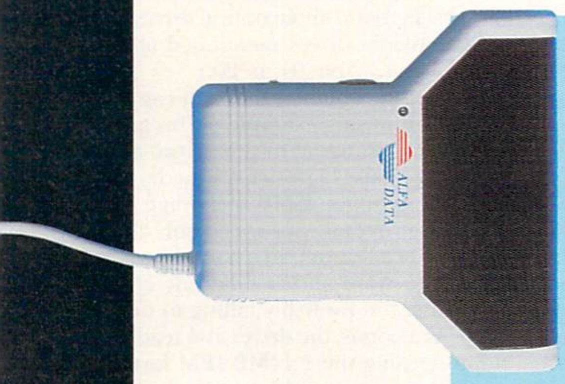
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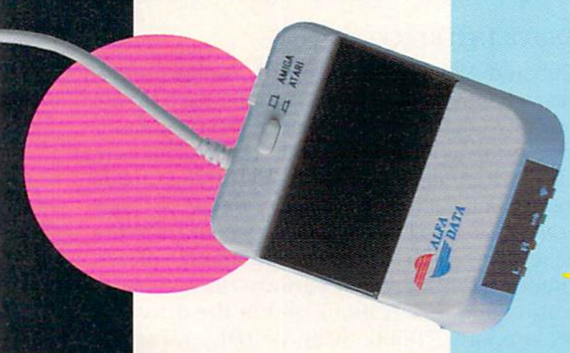
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The second standard, SCSI (Small Computer Systems Interface), is far faster and more flexible. A SCSI drive has its own intelligent controller, and you can control up to seven devices with a single SCSI computer interface. These devices do not necessarily have to be hard drives; there are tape-backup units, CD-ROM drives, scanners, and even printers that use SCSI interfaces.

The SCSI standard is the one most often used for Amiga and Macintosh computers, and it is gaining popularity with owners of high-performance IBM-compatible systems, as well. Some SCSI devices also support SCSI-2, an updated version of the standard that provides for much faster data-transfer rates.

The third standard, IDE (Integral Drive Electronics), is a sort of hybrid. As with SCSI, IDE drives include an intelligent controller, so that a minimum of interface hardware is needed to hook one up to the computer. The IDE controller, however, is simpler and slower than its SCSI counterpart. This makes it less flexible (it allows you to connect only two drives, and it cannot handle such devices as CD-ROM drives), but it is also cheaper. IDE has become the interface of choice for low-priced PC-compatible systems, and it also has been gaining popularity on the Amiga.

Other Mass-Storage Mechanisms

While fixed-media Winchester drives are by far the most common, removable-media storage devices—employing a variety of new technologies—are rapidly gaining wide popularity. The main attractions of these devices are portability (you can easily carry 80MB or more of data from one machine to another) and expandability (if you need another 80MB or more of storage space, just buy a new data cartridge instead of a whole new drive).

They are also useful for working with IBM and Macintosh emulators, since you can format cartridges as IBM or Mac hard drives and use them to exchange large amounts of information with IBM or Mac systems. Almost all of these devices are SCSI controlled, so you need an Amiga SCSI interface to connect them.

Removable Winchester drives consist of a fixed unit containing the read/write heads and motor, and the removable cartridges containing the magnetic media. Manufacturers like Ricoh and SyQuest make 5¼-inch units that store from 44 to 88 megabytes of data per cartridge. Costs run about $400 to $600 for the drive (including one cartridge) and about $125 for each additional cartridge. ***Great Valley Products*** (GVP) sells a Ricoh-based drive for the Amiga, the **Series II RH-5500**, while SyQuest-based offerings include the **Infinit 40** from ***Interactive Video Systems*** (IVS), the **SupraDrive 44R** (***Supra***), and the **HardPack 44** (***Advanced Storage Systems***).

Iomega's Bernoulli drives are similar, but their mechanism eliminates the possibility of the read/write heads colliding with the media (a disaster known as a "head crash"), making them more reliable than normal hard drives. You used to pay a large premium for this reliability, but Iomega recently dropped the price of its new 90MB drives to the same $600 level as the SyQuest 88MB units. Both removable Winchester and Bernoulli drives operate at normal (fast) hard-drive speeds.

A more recent storage innovation is the optical drive. It comes in both WORM (Write Once, Read Many) and read/write varieties. The key advantage to optical drives is vast storage space. Each 5¼-inch double-sided cartridge can store from 300 to 500 megabytes of data. Unfortunately, these drives are also slow (about one-fifth the speed of a normal hard drive) and expensive (costing upwards of $3000).

Newer versions of these drives use 3½-inch cartridges that are about the same size as a floppy disk but hold 128MB of data. They are less expensive (about $1700) and faster than the larger drives. Optical drives are available from a number of manufacturers, including ***GVP***, ***XYXIS***, ***Xetec***, and ***Active Circuits***. (If you would like more technical background about optical drives and the other removable-media drives mentioned above, consult "Bottomless Disks," Apr. '91, p. 20.)

The newest mass-storage option is the high-capacity floppy, and the most promising example of this genre is Insite's Floptical drive. Ranging in price from $500 to $600, these drives combine high-density media with optical head positioning to get 20MB of storage on a single floppy. While they operate at a speed only about halfway between those of a floppy and a hard drive, the media is convenient to store and is relatively cheap (currently $20 per disk and probably falling to under $10 later this year). As a bonus, the drives also read and write normal floppies using the 1.44MB IBM format.

While it's great to have a removable-media drive for backup and additional storage, it is not very practical to use one as your only mass-storage device. If you are booting from removable cartridges, each one must have the same Workbench setup. Switching cartridges is not as simple as changing floppies, either. Some Amiga hard-drive interfaces have trouble with removable-media drives, particularly if the cartridges are not all partitioned and formatted the same. It makes sense to have at least one small conventional hard drive for the essential programs you use all the time (like the Workbench programs) in addition to the removable-media drive.

Hard-Drive Interfaces

The A3000 and A2000HD are the only Amiga models that come with a hard-drive interface (and hard drive). If you own any other model, you need interface hardware and software as well as the hard-drive mechanism. A wide variety of Amiga interface hardware is available from several manufacturers. They vary in the way they transfer data from the drive, in how they connect to the computer, in the locations they use to mount the drives, in the additional functions they perform (such as memory expansion and acceleration), and in the drive formats they support (ST-506, SCSI, or IDE). *(Note: No prices are given for the products mentioned in this section or in the next one (combination boards). These items come in many varieties and prices, depending on system model, configuration, additional expansion options, and so forth. If you find items that suit your system needs, contact the manufacturers or your dealer to find out specific prices relevant to your setup.)*

The vast majority of Amiga hard-drive interfaces support the SCSI interface standard. SCSI is the interface of choice because it is fast, flexible, and can support up to seven different devices. If you have access to an inexpensive supply of ST-506 or IDE drives, how- ►

ever, you can probably find an interface that will suit your needs.

Pre'spect Technics in Quebec makes ST-506 interfaces for the A2000, A500 and A1000 computers. You may also be able to find an old ***Commodore*** **A2090** controller (the predecessor to the current A2091 model), which supports both ST-506 and SCSI drives. ***ICD***'s **AdIDE** interfaces work with any 68000-based Amiga model in allowing you to connect either a 2½-inch or 3½-inch IDE hard drive. ***IVS***'s **Trumpcard 500 AT** hard-drive expansion box for the A500 interfaces with IDE drives, and ***Roctec***'s **RocHard** and ***Expansion Systems***' new **DataFlyer Express** offer support for IDE drives, as well as a SCSI option.

The two main schemes for transferring data to the drive are DMA (Direct Memory Access) and Processor I/O. Processor-controlled interfaces use the computer's main processor to move data between the I/O port and the computer's memory. This method generally uses inexpensive hardware, and you can obtain good transfer speeds with well-written device-driver software.

DMA interfaces, on the other hand, move their data to and from memory directly, independent of the main processor. DMA interfaces are generally faster and multitask better because they allow the processor to continue running programs while the data transfer takes place.

On the other hand, they generally require more complex (and more expensive) hardware, and it is harder to design good device drivers for them. In particular, some DMA interfaces have problems with advanced processors that use data caching. Manufacturers that use DMA designs include ***Commodore***, ***MicroBotics***, and ***GVP***. Other manufacturers such as ***ICD***, ***Supra***, ***Comspec***, ***IVS***, and ***Pre'spect Technics*** use processor-controlled designs.

Some other factors to consider here are the way in which the hardware interface connects to the computer and the locations in which you can mount the drive. Almost all interfaces designed for the A2000 are boards that plug into one of the 100-pin Zorro II expansion slots. Most cards—including ***Commodore***'s **A2091**, ***GVP***'s **A2000 HC8+**, ***Supra***'s **WordSync**, ***MicroBotics***' **HardFrame/2000**, ***IVS***'s **Trumpcards** and **GrandSlam**, ***ICD***'s **AdSCSI 2000**, ***Expansion Systems***' **DataFlyer**, and ***Comspec***'s **SA 2000**—can be used in a "hard-card" configuration, in which a 3½-inch hard-drive mechanism is mounted directly to the card.

Some of these cards offer a metal frame or rails to which the drive may be attached, while others require you to mount the drive directly to the circuit board. A metal frame is preferable when mounting one of the larger and heavier drives, but this is probably not necessary for the current generation of thin, lightweight drives. These boards allow you to mount additional 3½-inch (or 5¼-inch) drives in one of the Amiga 2000's open drive bays. Some boards have an internal connection for additional drives, while others require a "Y" cable to connect two drives to oneinterface.

Units designed for the A500 or A1000 usually connect to the expansion port on the side of the computer. Some of the older models use a two-part design, where an interface card that plugs into the expansion port is connected by a cable to a box that houses the hard drive and power supply. Most recent A500 units—such as ***Commodore***'s **A590**, ***GVP***'s **A500 HD8+** and **A530**, ***Supra***'s **SupraDrive 500XP**, ***IVS***'s **Trumpcards**, (500, Professional 500, and 500 AT) and **GrandSlam 500**, ***Expansion Systems***' **DataFlyer 500**, and ***Roctec***'s **RocHard** drives—house the drive and interface in a single, low-profile unit that plugs right into the side of the computer.

Some of these units provide their own power supplies, either internal or external, while others provide a connector for an optional external supply. While it may be possible to run the hard drive from the A500's own meager power supply, you should look for a drive that offers at least an external power option, in case you decide to add more memory, another floppy, or an accelerator that might overburden the system supply.

While the A1000 has been out of production for years, several manufacturers still offer hard-drive adapters for the original Amiga. These include ***Xetec***'s **FastTrak Q52 A1000**, ***Expansion Systems***' **DataFlyer**, ***Comspec***'s **SA 1000**, and ***Pre'spect Technics***' **ALF** models. ***ICD***'s **AdIDE** interfaces, which connect to either a 2½-inch or a 3½-inch IDE drive, are the only ones that plug directly into the 68000 processor socket; they can be used with the A2000, A500, or A1000.

Different AdIDE models allow you to mount a 3½-inch drive in place of the internal floppy (in which case a hardware option allows you to use an external floppy as DF0), or to mount a tiny 2½-inch drive directly to the motherboard, using stick-on feet.

Multipurpose Combination Boards

Many hard-drive interfaces offer such additional functions as memory expansion and processor acceleration. These combination boards are so popular, in fact, that they outnumber those offering merely hard-drive capabilities. Built-in memory-expansion capabilities are found in many A2000 interface cards such as ***Commodore***'s **A2091**, ***GVP***'s **A2000 HC8+**, ***IVS***'s **GrandSlam 2000**, ***ICD***'s **AdSCSI 2080**, and ***Advanced Storage Systems***' **Nexus**. Other boards, such as ***Expansion Systems***' **DataFlyer**, offer memory expansion as an optional extra.

Although most people buy accelerator boards to get a faster processor and 32-bit memory expansion, some of these boards also include a hard-drive interface. ***GVP***'s **68030** and **68040 Combo** accelerators both include a SCSI hard-drive controller, as do some of the newer 68040 boards, such as ***Progressive Peripherals***' **Zeus** and ***CSA***'s **40/4 Magnum**.

Combination boards are just as popular for the A500 as for the A2000. Many A500 hard-drive boxes provide memory-expansion interfaces. Among these are ***Commodore***'s **A590**, ***GVP***'s **A500 HD8+**, ***Supra***'s **SupraDrive 500XP**, ***IVS***'s **GrandSlam** and **Trumpcard 500 AT**, ***Expansion Systems***' **DataFlyer 500**, and ***Roctec***'s **RocHard**. ***GVP*** even offers a combination accelerator, memory-expansion, and hard-drive unit: the **A530**. ***ICD*** offers the **AdSpeedIDE** board, which combines an AdIDE interface with an AdSpeed accelerator.

Device-Driver Software

The final element of an Amiga hard-drive system is the driver software. Most interfaces store this software ►



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on an EPROM chip right on the board, thus allowing you to boot directly from your hard drive. Driver software is fine-tuned from time to time, both to make the controller work with new devices and new system software (such as Kickstart 2.0), and to increase data-transfer speeds. If you bought a hard-drive interface a while ago, or if you are thinking of buying a used interface, you'd do well to ascertain that it has the latest version of the driver. Although system software is something that you cannot see or feel directly, it has an important impact on your interface's compatibility and performance.

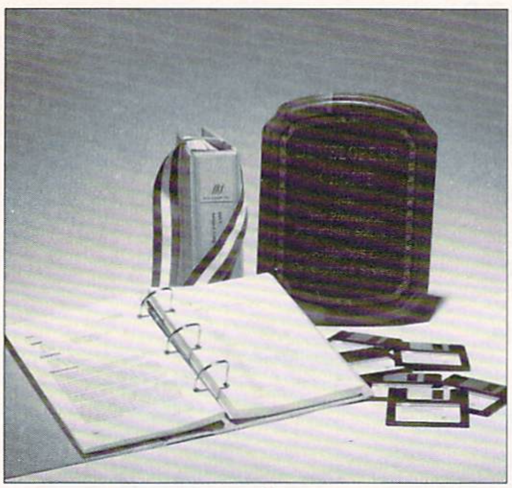
One thing tocheck is whether the driver adheres to Commodore's Rigid Disk Block (RDB) standard, which dictates how drive-layout information is stored on the disk and makes it possible to plug a drive formatted on one manufacturer's interface into that of another manufacturer so that it is able to read the data. This interchangeability is particularly important when dealing with external drives or removable media. RDB adherence also enables you to use Commodore's HDToolBox program to partition the drive.

Another question to ask about driver software for SCSI interfaces is whether it supports the SCSI Direct commands defined by Commodore that allow communication with SCSI devices other than hard drives. This is particularly important when dealing with devices like tape-backup and CD-ROM drives.

In addition to driver software, most hard drives come with set-up software that lets you partition and format the drive. Most use simple point-and-click interfaces, so you can divide the disk into two or more logical devices of different sizes. Some also perform AmigaDOS formatting. Most Amiga hard-drive systems are a "plug-and-play" proposition. As long as you have Kickstart 1.3 or higher, just attach them to your computer, and you can boot directly from the hard drive. Most even come with Workbench software already installed.

A hard drive can really help you get more use and enjoyment from your computer system. It is much faster than a floppy and often provides essential increased storage capacity (some of the files created by today's 24-bit graphics programs are too large to store on a single disk). Moreover, many complex application programs, and even some games, require a hard drive to run. Current models are much easier to use and much less expensive than those of even a couple of years ago. About the only problem you can expect when you buy a hard drive today is figuring out how you got along without one in the past. ■

Sheldon Leemon is an authority on virtually every aspect of the Amiga. When he's not writing books or articles, he works at Slipped Disk, a Michigan Amiga dealership. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*



ACCENT ON GRAPHICS

Electronic Batik

42

A continuing series of tips, techniques, and tricks for creating more imaginative Amiga graphics.

By Joel Hagen

BATIK IS A centuries-old fabric-dying technique developed in Java. Designs are applied to cloth using a material such as beeswax that resists dye when the cloth is dipped in color. The wax is removed from the dyed fabric, and the process is then repeated with a new color. During the procedure, dye seeps along cracks in the wax, forming complex patterns of irregular lines through the design. On the Amiga, you can use a combination of painting and image-processing techniques to achieve a similar effect.

There are a number of ways a computer artist could approach this idea. I will focus on methods that use DeluxePaint (Electronic Arts), Art Department Professional (ASDG), and PIXmate (Progressive Peripherals). Let's try the simplest method first, then explore some more complex variations on the concept.

Basic Batik

Look through your old HAM images for a colorful picture with which to experiment. Load it into PIXmate and use the HAM>32 menu selection to convert it to 32 colors. This reduction of colors simplifies the forms and shapes of the image while retaining its character. Save this 32-color image and press the i key to bring up PIXmate's image-processing tools. Click on MF2, a median filter, to further simplify the image by reducing the dithering.

Next, select Extract from the Color menu and reduce the image to either its red, green, or blue color plane. Return to the image-processing tools and select EDG to perform an edge detection. When that is complete, you should be looking at a monochromatic version of your image consisting of red, green, or blue outlines. Save this image and quit PIXmate.

Load the outline version of the image into DPaint. Next, load the 32-color version of your picture to the spare screen. Return to the outline screen, be sure the background color behind the lines is transparent, and pick up the lines of the entire screen as a brush. Switching to the main image, select Color mode, F2, and choose the darkest palette color. Align the outline brush precisely with the image, but don't stamp it down. You should see shape areas within the image neatly outlined in a dark color. To bring some interesting irregularity to the outlines, hit the Shift-O key combination to thin the brush. Stamp the brush down on the image and save it.

There is an interesting challenge involved in using this technique: How to get irregular outlines around some, but not all, of the image elements. Part of the solution lies in extracting a single color plane from the image before performing edge detection. The extraction eliminates some shapes from the image. Resulting outlines fit the full-color image, but highlight only some of its shapes. The other part of the solution is the Brush Trim operation, Shift-O.

You can also try some variations on this method. Experiment with multiple passes of the Median Filter or the AVG averaging operation in PIXmate prior to doing an edge detection. This will increase the simplification of the shapes. Try edge detection on the full-color image and on other extracted color planes. Each will have its own character. If most of your lines disappear when you press Shift-O in DPaint, perform an AVG averaging operation on the outlines in PIXmate before bringing them into the paint program. This will thicken the lines enough to preserve them when you trim.

Try laying the outlines over the original HAM image, either at full opacity or at some level of translucency. Also, select different colors for the lines. There is an easy way to do this in DPaint before you stamp the lines over a 32-color image. Position the brush, press F2 for the Color mode, and then press one of the bracket keys ([or]) to cycle the lines through all the palette colors.

Advanced Art and Craft

You might try more complex experiments to simulate the look of batik. One of my favorite ways to create an

By combining painting and image-processing techniques, you can create subtly complex batik patterns with rich, beautiful colors.

image is to build it in translucent layers in AD Pro. Simply set the Load method to Composite and the Mix to 50% (or whatever percentage seems appropriate). Work with images having the same dimensions, say, 320×400, and keep layering new images into the composition. Execute a HAM rendering to view the results.

The illustration accompanying this column shows a HAM image resulting from ten or twelve composited layers. Several HAM floral paintings were combined with abstract color screens and a portrait. As images overlap each other, unforseen patterns form as though dye were seeping into cracks in the wax of a batik.

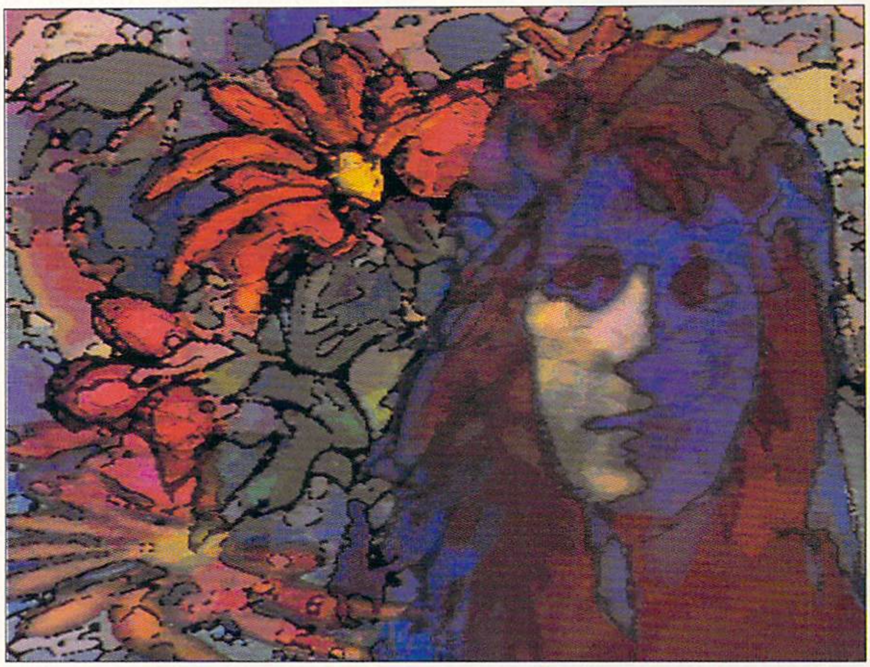
As the image grows in complexity, it may be desirable to emphasize certain elements. This is easy to do if you plan ahead. Create separate elements against a pure black or pure white screen. In AD Pro, the R, G, and B Mix controls let you specify any color as transparent. Zero in all three boxes makes black transparent; 255 in all boxes makes white transparent; and –1 in all boxes leaves nothing transparent in a Mix. If you want to reemphasize an image element that has been lost under too many layers, merely reload that element from a transparent background at a 20% Mix. If it is still indistinct, repeat the load.

In the illustration, edge-detection outlines were added at three stages in the growing composition. This yields a more subtle effect than doing a single, final line layer. Early lines are reduced by successive image layers, blending them with other shapes. Experiment with AD Pro's Line Art operator for outlines. Thin each set of lines in DPaint as described, then stamp them in place as black lines on a white screen. In AD Pro, set Mix to 60% and R, G, and B values to 255 when loading the lines into the composition.

In the illustration, I edited the final set of lines in DPaint, erasing everything but the lines around floral patterns. When these were added to the image, the result was that those areas were emphasized without adding distracting lines to the face.

You can do all the layering directly in a paint program, but you will find that HAM artifacts begin to foul the picture. By doing its work in a 24-bit color space, AD Pro avoids cumulative artifacts. The HAM image (or any format you prefer) is calculated at the final stage. You can use the 24-bit image if you have a 24-bit display board or a film recorder such as the Polaroid CI-3000, which is directly supported by AD Pro modules. I often convert my 24-bit images for viewing with DCTV (Digital Creations). The results are beautiful. ■

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a stamped, self-addressed envelope for a reply.



In the "Batik" illustration above, multiple images were layered in Art Department Professional using translucent Mix levels. Image-processing techniques produced outlines that were added to the picture at three stages.



Nonlinear Editing

Add ShowMaker to your video-editing setup to get the capabilities of digital nonlinear editing systems at much less cost. Add an optical-disc recorder, too, and you've got nirvana.

By Martin Ricketts

A DIGITAL, NONLINEAR presentation composition. It sounds complicated, but it is not. Nonlinear composition is a means by which you can create elaborate productions in a fraction of the time it would take with conventional video-editing techniques.

A true nonlinear editing system lets you digitize all your stock footage to high-capacity, phase-change optical discs. Finding and accessing video segments on the mass-storage discs is extremely fast compared to tape, and you do not have to contend with prerolls as in traditional editing. Thus, you can build an edit decision list and review your edits in real time as they will appear in the finished production. As you can imagine, such a system is far more expensive than a traditional edit system, running from about $25,000 to $80,000.

The less expensive traditional method involves two or more VTRs and a dedicated or computer-based edit controller. Whether you use a cuts-only system (one source deck and one record deck) or an A/B roll setup (with two sources and a destination deck), the method is linear, meaning that you must roll backward and forward through the tape to find the segments you need.

(To contact the vendors of the products mentioned, see the "Manufacturers'/Distributors' Addresses" list on page 106.)

A Happy Medium

Gold Disk's **ShowMaker** ($395) lets you combine benefits of both methods. While you may know ShowMaker simply as an image-sequencing program, it is actually much more powerful than just that, supporting professional video equipment and giving you real-time control over it. It was not designed for video editing, but it can augment traditional edit systems to approach the effects of nonlinear systems. With ShowMaker, you compose your entire presentation—including video segments, digital graphics, and sound—within the Amiga, and record the results to tape as you work.

Preparing a videotaped presentation with ShowMaker offers many benefits, the best of which is that you get to see your results right away. The downside of this is that it requires immediate access to all source material you plan to include. Immediate access is not a problem for animation, genlocking, Toaster commands, MIDI music, or sound samples, because these elements are either loaded into memory or performed digitally. With videotape footage, however, access time is an issue. In fact, video-access time is the only thing separating a ShowMaker/VTR setup from systems such as the nonlinear, Mac-based Avid 200.

Because of this, ShowMaker is not the right tool to use for a project that involves cuts from clip to clip in rapid succession. On the other hand, it is perfect if you want to create a tape that incorporates lots of graphics keyed over video, or if you wish to shift in and out between the source VCR and still images with DVEs. It's also helpful for synchronizing all of this to a MIDI soundtrack (no SMPTE time code needed!) and adding sampled sound effects.

Editing and Beyond

To turn ShowMaker into a video-editing tool, you need a device such as ***Selectra***'s **VuPort** ($750), which doubles as an interface to ***Panasonic***'s **AG-1960 SVHS VCR** and an edit controller. Using VuPort, you can simply cut segments of video and arrange them onto another tape in the order you wish to use them. Then you can use ShowMaker's time line to add transitional effects, graphics, and sound, and finally to record the results in real time to a master tape. Under this setup, a VCR's linear approach is not necessarily a limitation because seek time is reduced.

Any system that involves more than one video source requires a method for switching between them. A ShowMaker video system is no exception. ***NewTek***'s **Video Toaster** is just the switcher for such a setup, because ShowMaker supports it directly. In fact, ShowMaker's elegant and easy-to-use Toaster control is a very powerful part of the program.

Although you can run ShowMaker from the same machine that the Toaster occupies, for advanced applications you will want a second Amiga to house the Toaster. The reason for this is that the Toaster takes complete control of the computer when it runs, leaving few system resources for ShowMaker. The Toaster thus slows down such ShowMaker functions as MIDI timing, animation playback, and digital audio.

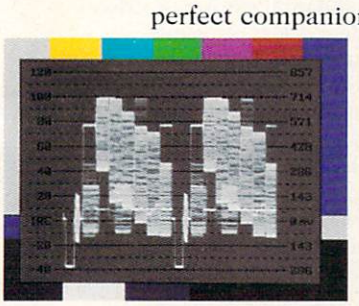
A good setup for professional work, then, is two A2000s, one of them containing the Toaster, a hard drive, 6–8MB of RAM, and either one dual-channel or two single-channel TBC(s). The other A2000 would house a 50–100MB hard drive, 6–8MB of RAM, an accelerator, a multiport serial board hooked to an edit controller, and—for adding sound—a sampler and a MIDI ►

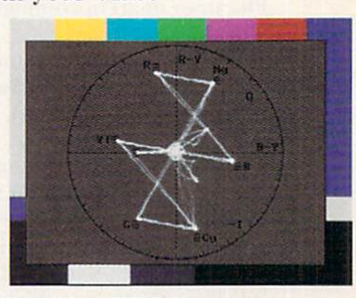


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interface connected to a MIDI module. Then, to combine your video with Amiga graphics, you need a genlock/encoder. And finally, you need two or three SVHS VCRs connected to an edit controller.

While this system may seem elaborate, I recommend it. It allows you to use footage from a VCR or from the Toaster's framebuffers, and to synch that video with a computer-controlled sound track via MIDI or internal sound samples.

The more memory you have, the happier ShowMaker will be; 8MB is not unreasonable with memory prices dropping. An accelerator is really not an option, because ShowMaker does not work well without one. Developers such as Great Valley Products (GVP) and Progressive Peripherals offer memory and acceleration on one board for a reasonable price. The size of the hard drives you choose will depend on the amount and type of animation you use, but I recommend at least 50MB.

A MIDI audio source, one of the most important production tools to consider, is the best means of incorporating sound in a nonlinear environment. Because MIDI modules are computer controllable, they can instantly access sounds and play them at any specified point on a time line. ***Roland***'s **SC-55 Sound Canvas** is a proven sound module that conforms to the increasingly-popular General MIDI music standard. To connect it with your Amiga, you need a MIDI interface. ***Dr. T***'s **Phantom** is a good choice, because it also supports SMPTE time code. (Gold Disk promises support for The Phantom in an upcoming version of ShowMaker.)

Another source for sound is a digital sound sampler (such as ***SunRize***'s **AD1012 12-bit digitizer**), which lets you record any effect and use it in a ShowMaker production under MIDI control. ***Digital Creations*** makes the only software-controllable genlocks, and ShowMaker supports them directly. The **SuperGen 2000S** internal model has an excellent SVHS encoder and easily synchronizes to a master edit system.

Your edit controller may work with such units as ***NEC***'s **PC-VCR** or the lower-priced ***Panasonic* AG-1960**. NEC has the advantage of a built-in RS-232C serial interface, so you need not buy an external interface or a retrofit VCR. (Reportedly, though, Panasonic will soon incorporate an interface into its system.) Also, NEC lets you stripe any tape with its proprietary addressing system and then access individual frames using ShowMaker or other control software.

While Panasonic's proprietary addressing system lets you access only tapes recorded on that machine, you can choose the alternate BOT (Beginning-of-Tape) method. BOT is not frame-accurate, but it works much faster that the PC-VCR's system, thus making the AG-1960 more conducive to real-time systems.

Some software tools make great complements to the ShowMaker setup.

> With ShowMaker, you compose your entire presentation—including video segments, digital graphics, and sound—within the Amiga, and record the results to tape as you work.

These include ***ASDG***'s **FRED** (Frame Editor), which calculates such effects as moving an object across the screen over a specified time, and ***The Blue Ribbon SoundWorks***' **Bars&Pipes Professional**, which lets you control the Toaster, SuperGen, and SunRize's AD1012 from its own time line.

Help Yourself

Whatever type of setup you have, you can make your job easier by following a few suggestions to work around the inherent limitations in a real-time system using VTR technology.

First, avoid using overscan, high resolution, and four bitplanes simultaneously for your images. Using two of these elements is fine, but all three together will bog down your system. Another tip to help make your productions play faster is to keep all your animation files together in a single drawer on your hard drive so that they are easy to access.

Because ShowMaker supports MIDI Song File One format, you should save any music files you use in that format. Also, to make certain ShowMaker starts the music at the precise moment you wish, add an empty bar to the beginning of each song when you save it.

When possible, use MIDI instead of internal sound samples. While the Amiga's internal eight-bit sampling is good, it cannot compare to the quality dedicated samplers turn out. And keep in mind that ShowMaker cannot play sound that is sampled at rates higher than 256K. While other programs can play at higher rates by overtaking the Amiga's hardware and shutting down other resources, ShowMaker cannot do so, because it controls much more than sound alone.

A Greater Advantage

If video-access time is the only real advantage expensive nonlinear systems have over a ShowMaker setup, then you could overcome this by adding an optical-disc recorder to your Amiga, right? Sure you could. But before you start celebrating, be aware that even write-once optical recorders start at $15,000. ***Panasonic***'s **LQ-4000**, which runs to $28,000, can be rewritten a million times (try that with a tape!).

If you intend to use a fair amount of 24-bit animation, however, or wish to produce commercials, music videos, or other dynamic productions with tight synching and lots of graphics, then an optical system is worth it. It is also more cost-effective than traditional editing if you're considering such videotape formats as MII, 3/4-inch SP, BetaCam, or BetaCam SP.

It is important to note that optical-disc recorders are not digital, as are the Avid and comparable devices. They record in an analog format, using amplitude modulation similar to videotape. Thus, there is loss of picture quality over subsequent generations. Despite this, the picture quality far exceeds all but the very best formats such as BetaCam SP, D2, and one-inch.

While the the luxury of optical-disc-based editing is not so affordable, the luxury of ShowMaker is. And its nonlinear approach embodies the future of video editing. ■

Martin Ricketts is president of MEDIA Innovations, a Canadian company specializing in Amiga-based multimedia presentation and production systems. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

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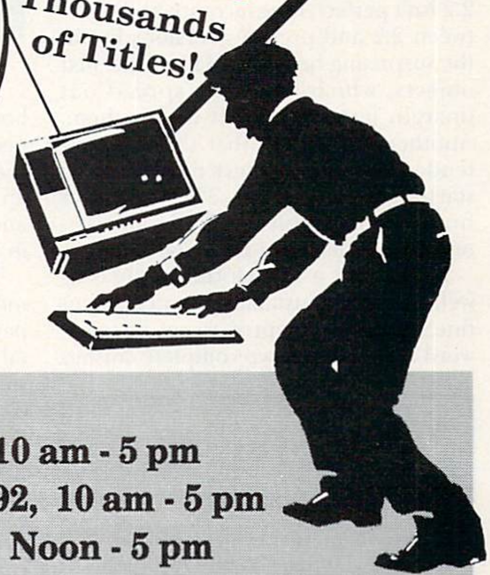
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From p.24.
text), other publishing programs that communicate with HotLinks should be able to make use of edition text and the associated styles and tags.

PageLiner has some convenient editing features, including the ability to set styles and tags, to select text through double-clicking (words) and triple-clicking (paragraphs), and to extend selections through shift-dragging. It also includes a speedy and fairly accurate spelling checker that has an improved version of the PageStream dictionary and allows for additions during the checking process.

BME, a very simple bitmap editor intended only for extremely minor touch-up jobs, displays any bitmap as a gray-scale image. Its most important function right now is probably to stage images from regular files into editions.

While much improved, PageStream 2.2 isn't perfect. One incompatibility between 2.2 and previous versions lies in the surprising behavior of multiline text objects, which suddenly spread out (margin justify) the text within them. Another problem is that the fonts intended to speed up text display are of startlingly poor quality. They take over from the previously set Times and Triumvirate fonts, but I removed them.

Be wary of a few HotLinks areas as well. While the installation process went fine, when I attempted to set up password access, I had two complete crashes because the program couldn't find the password file. Also, the requesters aren't good at handling the large, virtual-screen Workbench displays (mine is 1280×800, displaying 640×400); they always appear in the center of the virtual screen. At least if you move the display, it remembers its new location. This problem is also present in PageLiner.

The minor annoyances all have workarounds, however, and version 2.2 is a necessary and important upgrade for current PageStream users. HotLinks Editions is worth the price to PageStream users, as well. You'll find HotLinks and PageLiner most helpful, but while BME is vital for importing graphics into HotLinks, it is very limited for manipulating images. In all, I am an even happier PageStream user than I was before.

—Mark Cashman



YOUR TURN!

I'm very impressed by the simplicity of HotLinks Editions' Publish/Subscribe/Update features. Being able to zap graphics into BME for touch-up and cropping is great, as is the ability to convert graphics. PageLiner is the most problematic link in the chain. While editing text from PageStream is a great concept, it's usually faster to do it in PageStream proper. PageLiner is slower than the slowest turtle!

J.R. Bookwalter
Mogadore, Ohio

G-FORCE COMBO

Great Valley Products, $749 or $1799.

A2000.
Internal, CPU slot connection.
Installation: Easy

25- or 50-MHz 68030 accelerator with 32-bit memory and hard-drive controller.

Available in both 25-MHz and 50-MHz versions, the G-Force Combo boards (which replace GVP's discontinued Series II cards) provide a 68030 processor, a SCSI hard-drive controller (and an external SCSI connector), a hardcard, and 32-bit RAM—four expansion cards in a single slot.

The 25-MHz card comes with one megabyte of 32-bit RAM and can be expanded in four-meg increments to a total of 13, while the 50-MHz card has a standard four megs and can be increased by four-meg jumps to 16.

The A2000 can address only nine megabytes of memory, so you must designate the G-Force RAM to reside only in extended RAM addresses or split it between the standard RAM auto-config space and extended address space. With a full 16MB, 50-MHz card, eight megs are usually placed in auto-config and eight in extended space.

Hardware installation is quite simple. To add RAM or use the G-Force as a hardcard, however, you'll have to write another check for accessories: GVP's four-meg SIMM modules ($299) and hard-drive mounting kit ($49).

Software installation is equally easy. You get such 68030 utilities as MemTest (checks on-board RAM) and FPU_Test (tests the math coprocessor). For significant speed increases, use the GVPCpuCtrl command to map your Kickstart ROM into 32-bit RAM space. The FaaastPrep software walks you through partitioning and formatting a hard drive, and the manual documents all installation procedures well, including even a section for Bridgeboard users.

To put the systems through a real-world environment, I tested the 25-MHz G-Force in the Video-Toaster-equipped A2000 in *AmigaWorld*'s video studio, and the 50-MHz card in my A2000. Both systems are equipped with AmigaDOS 2.0, although the video-suite system occasionally uses the 1.3 OS. The cards worked fine with both OS versions.

Compared to the standard A2000 performance, the 25-MHz Video-Toaster system was fast, with all aspects working fine. In addition, when we used the built-in SCSI controller to handle a SyQuest removable-media drive and a Quantum hard drive, disk access seemed faster.

Replacing Commodore's 2630 25-MHz accelerator, the 50-MHz G-Force significantly improved performance. Software compatibility was never a problem, and the time required for image rendering and processing was cut in half.

Finally, I used Lamont Koop's AIBB4 software to benchmark the accelerators and compare them to the performance of a 25-MHz A3000. (See Table 1 for results.) The 25-MHz G-Force card is the virtual equal of the A3000, while the 50-MHz version is about twice as fast. If you're doing floating-point-intensive work, you should note that the G-Force's 50-MHz 68882 FPU is in many ways faster than the FPU built into the more advanced 68040 processor.

Table 1. Benchmark tests comparing G-Force to the A3000.

	A3000	G-Force 25 MHz	G-Force 50 MHz
WritePixel	1.00	1.03	1.50
Sieve	1.00	0.99	1.96
Dhrystone	1.00	1.04	1.73
Sort	1.00	0.99	1.88
Matrix	1.00	1.01	1.90
IMath	1.00	0.99	1.88
MemTest	1.00	0.94	1.47
TGTest	1.00	1.04	1.12
Savage	1.00	1.00	1.99
FMath	1.00	1.00	1.99
FMatrix	1.00	1.04	1.96
BeachBall	1.00	1.08	1.77
SWhetstone	1.00	1.19	2.33
DWhetstone	1.00	1.01	1.93
FTrace	1.00	1.01	1.94
CplxTest	1.00	1.03	1.83

All in all, both cards are very reliable, high-performance, multifunction add-ons. If you need an accelerator, you would do well to consider them. If you need RAM, a hard-drive controller, and a faster processor, look no further.

—Lou Wallace ►

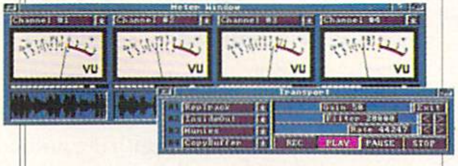
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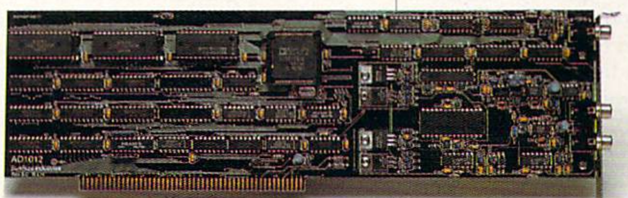
The Video Toaster goes a long way towards solving your video problems. But what about sound? Do you need to synchronize background music with your productions? How do you add footsteps, door knocks, and other sound effects to your video or animation? Do you need to fade, cross fade, or eliminate sections of audio? Can you edit your audio, or are you stuck with the first take?

Studio 16 solves all these problems by turning your Amiga into a complete sound studio. With Studio 16's SMPTE support you can lock sounds frame accurately with your video. Audio triggers reliably, at the same spot, every time. Or you can quickly slip your audio effects, trying them at different spots. And since Studio 16 plays directly off hard disk, the number of sounds you can trigger is unlimited.



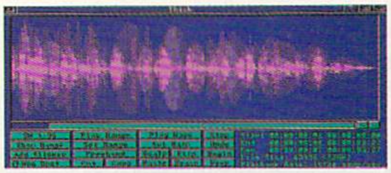
Each of Studio 16's four tracks can be metered and mixed. Unlike two track systems, Studio 16 can combine multiple tracks with no generation loss. And it can record while playing.

The Studio 16 sound editor graphs the audio waveform and allows you to cut, copy, and paste audio. Zoom, scale, fade, reverse, and many other functions are available. Edits can be non-destructive or permanent.



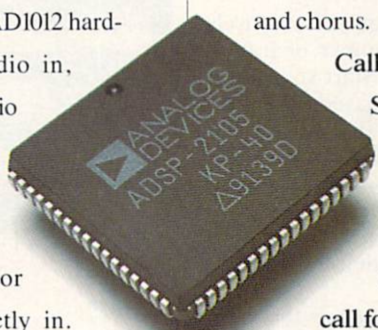
The included AD1012 hardware provides audio in, SMPTE in, and audio out connectors. Just plug your VTR, CD player, radio, tape deck, or other source directly in. Then record with 12 bits at sampling rates up to 80,000 samples per second. The AD1012 can synchronize and chase SMPTE time code at 24, 25, 29.97, and 30 fps.

how does the 12-bit AD1012 sound? Absolutely great!
— Amiga World, 4/92, p.29



Designed to exceptional audio standards, the AD1012 offers CD frequency response and 70dB signal-to-noise ratio.

The AD1012 includes a special sound coprocessor — the advanced 2105 DSP. The DSP allows Studio 16 to perform real time mixing and high quality 16 bit effects. These include echo, flange, delay, and chorus.



Call today for a free Studio 16 information packet, (408) 374-4962. Fax: (408) 374-4963. Dealers: call for promotional package. Salespeople: call to join our commission program.

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The Complete Colour Solution

Rombo Productions, $179.95

All Amiga models.
External, parallel-port connection (Vidi-Amiga).
Installation: Moderate.
Compatibility notes: Vidi-Amiga: A1000 requires Rombo's gender changer; A2000s and A3000 require parallel-port extender.
Hard-drive-installable software.
Not copy protected.
2.0 compatible.
Minimum system: 512K RAM.
Recommended system: 1+MB RAM.

Real-time framegrabber, electronic color splitter, and image-processing and paint software.

The lineup of video digitizers in the US has a new challenger from Scotland. A respectable digitizing package, The Complete Colour Solution is composed of Vidi-Amiga (a real-time framegrabber), Vidi-RGB (an electronic color splitter), VidiChrome-Amiga (image-processing software), and Photon Paint (a HAM paint program).

Vidi-Amiga

Vidi-Amiga is capable of grabbing one or more frames from either a live video signal or a VCR in a 16-shade grayscale. (The manual promises one frame capture in 20 milliseconds.) You can later colorize the frames individually with one of the nine preset color palettes or one of your own.

Operation of the program is relatively simple. Specify the number of frames you want grabbed, and start your video source. The video is displayed directly on your Amiga's monitor (no other is required), and you click the left mouse button when you want the grab to commence. Vidi-Amiga grabs the number of frames you specified (up to the limit of your memory; each megabyte holds about 25 frames).

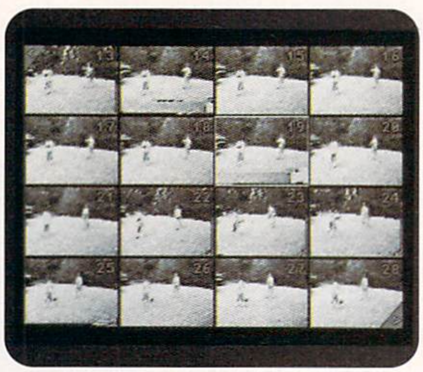
A second mouse click stops the grab, or you can define a frame stop point to end the cycle automatically. I recommend the latter method, as Vidi-Amiga continues grabbing frames—overwriting previous ones—until you click. For example, if you ask it to grab six frames, it will do so; but then it grabs a second set of six, replacing the old frame 1 with a new frame 1 and continuing the cycle until you halt the grab.

When finished, you can display all the grabbed frames in a miniature storyboard, and you can clip, copy, move, or erase them. Vidi-Amiga also provides an animation facility that plays the grabbed sequence.

One unique feature is the ability to define windows within frames. This allows you, for example, to have multiple frames of video (such as a wide shot and a closeup) within one frame. Alternatively, you could run multiple animations at the same time. (Remember those 1960's films that had the screen divided into a grid, with something different happening in each square?) You can move the windows around, snap them to a grid, and resize them at will.

While its image quality is reasonably good right out of the box, Vidi-Amiga has both hardware and software controls to improve the images. On the digitizer itself are rough adjustments for brightness and contrast; you can tweak these with your actual video on the screen (before starting the grab). Of course, this requires you to perform quite a feat of contortion, because the digitizer is behind your computer. You shouldn't have to mess with these controls very often, however; once set, they'll work for most of your grabs. Most adjustments are handled by the fine-tuning control for brightness within the software.

The manual boasts that Vidi-Amiga is ideal for professional video and presentation applications. Good image quality? Yes. Professional video standard? No, the 16-color grayscale knocks it out of the running for professional work. Presentation tool? Absolutely, it's great for creating rough storyboards for clients.



Vidi-Amiga displays your captured frames in a storyboard.

Supporting Cast

Vidi-RGB is an electronic color splitter that connects to Vidi-Amiga (or NewTek's Digi-View) via an included RCA cable. (You'll have to invest about $15 for a US-standard power supply.) Under the supplied VidiChrome-Amiga software's control, Vidi-RGB separates an image from a color-video source (camera or VCR) into its red, green, and blue components and presents an on-screen HAM picture, all in less than one second. Because Vidi-RGB handles only stationary images, however, your VCR must have a rock-steady pause/still frame control and your color camera must be tripod or copystand mounted.



The Complete Colour Solution lets you save a color window (the engine) within a color frame (the Triumph TR-6).

Using the VidiChrome color-processing software, the color-separation process is automatic and very quick, and it produces a good basic image. Unfortunately, Vidi-RGB provides you with only two hardware controls—brightness (black-and-white level) and saturation (chroma)—and one software control for brightness. Maybe 50 percent of the time it isn't a problem, but the rest of the time you'll wish you had more tweaking controls.

One solution is to buy a separate image processor, such as ASDG's Art Department Professional or Black Belt's ImageMaster. The other is to use Vidi-RGB with Digi-View, manually stepping through the electronic RGB filtering process via the button on the Vidi's case. Between the NewTek software and the manual filtering, the process is much slower. The upside is that Digi-View 4.0 gives you many more image-processing controls.

There is one other Vidi-RGB feature that's of interest to video experimenters: The hardware package includes an Input/Output 25-pin connector that provides access to all output signals of the unit as well as providing input pins for S-type signals.

The Big Picture

If you like the idea of digitizing animated sequences into your Amiga in real-time (even if they are 16-shade black-and-white), then Vidi-Amiga is about

Continued on p. 70.

All photographs are of actual DCTV screens.

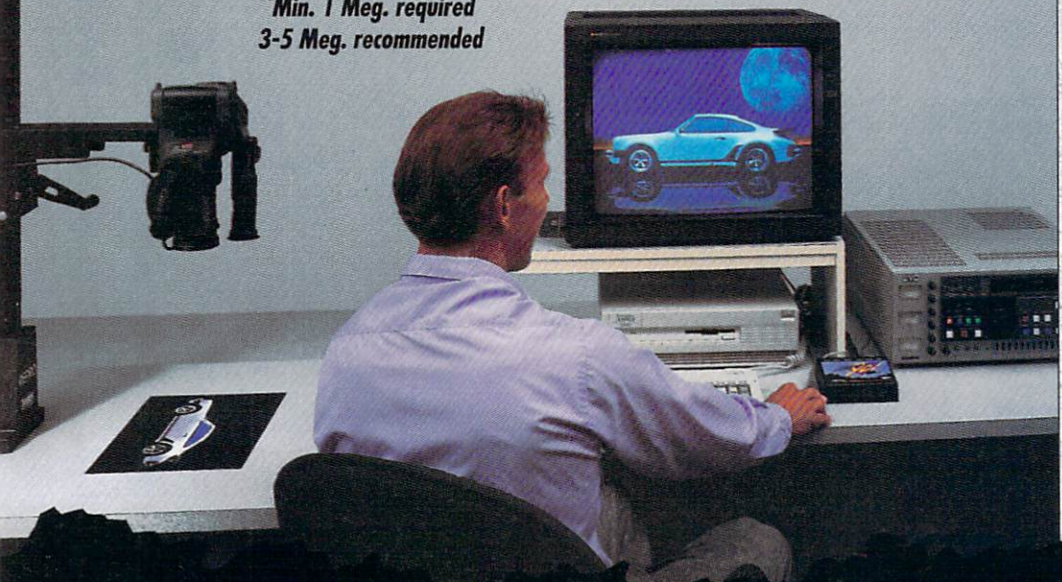
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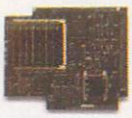


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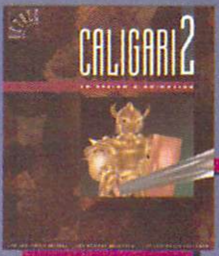
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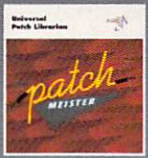
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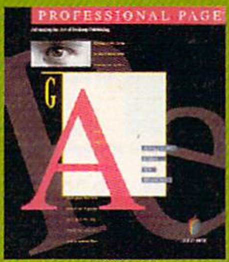
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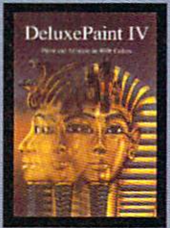
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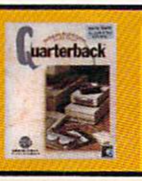
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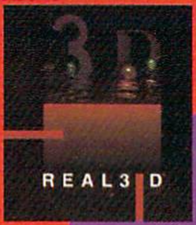
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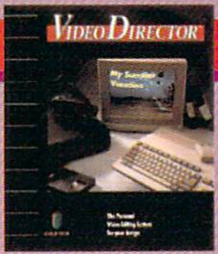
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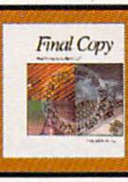
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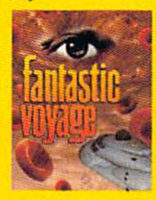
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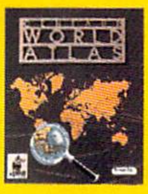
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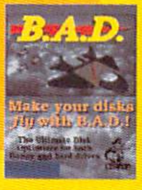


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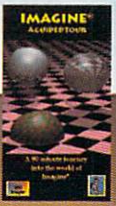
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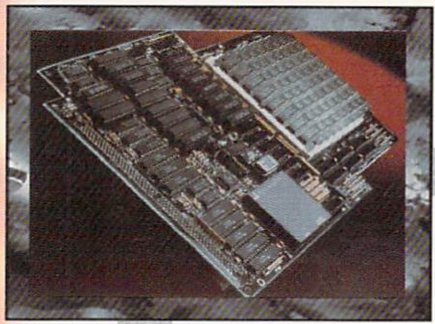
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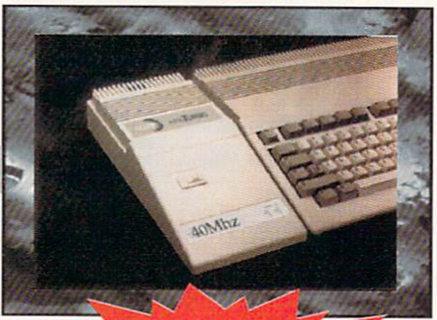
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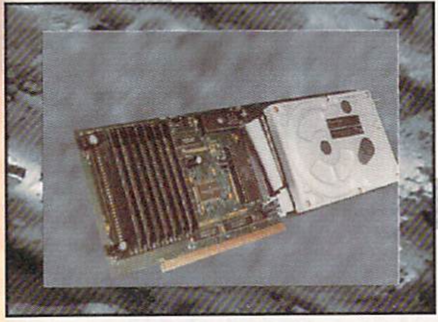
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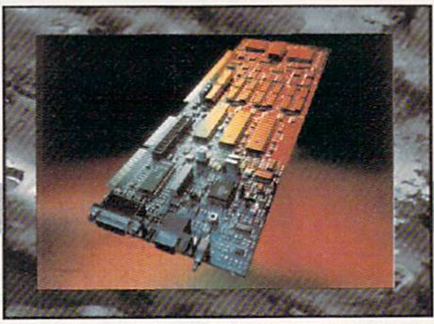
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From p. 60.
your only low-priced choice. The IFF results are very acceptable, especially as fodder for further manipulation in other paint, animation, or presentation programs.

The color side is more problematic. Yes, Vidi-RGB's electronic color filtering is both quick and convenient, but Vidi-Chrome-Amiga is very limited. An older HAM paint program, Photon Paint is still quite capable (for a review, see Aug. '88, p. 20). Be warned, however, that Photon Paint's manual is abridged from the original, and the other manuals are crude and basic, offering no tutorials.

Until recently, the real stumbling block for The Complete Colour Solution in the US was the rate of exchange. The package was simply too expensive to compete. Now, however, Rombo has done a 180-degree turnabout, reducing the four-part package to $179.95. For a real-time digitizer, color splitter, image processor, and paint program, $180 is a helluva good price.

If you already own a camcorder, The Complete Colour Solution offers a truly bargain-basement entrance to both still and motion digitizing. Even considering its shortcomings and occasionally quirky operation, it is impossible not to recommend such a value.

—Gary Ludwick

Mr. Robot's Speak 'n' Spell

Brain Technologies, $49.95.

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 512K RAM.
Recommended system: 512K RAM.

Vocabulary tutor for ages six and up.

Amy's Fun-2-3 Adventure

Devasoft, $49.95.

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 1MB RAM.
Recommended system: 1MB RAM, hard drive.

Counting games for ages 2-6.

FlashBlaster

EasyScript! Software, $49.95.

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 1MB RAM.
Recommended system: 1MB RAM.

Math arcade game for grades K-6.

Mathasaurs

CanCor, $24.95.

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 512K RAM, joystick.
Recommended system: 512K RAM, joystick.

Arcade game for ages three and up.

Purchasing educational software is often a highly chancy proposition. Some programs are the equivalent of junk food, providing empty calories with precious little educational value. Some potentially good games are marred by bad design decisions, resulting in frustrating experiences for young gamers. Worst of all, others lack the most important commodity—fun. The good educational games often get lost in the clutter. Mr. Robot's Speak 'n' Spell, Amy's Fun-2-3 Adventure, FlashBlaster, and Mathasaurs are good examples of each of these.

Mr. Robot's Speak 'n' Spell

Mr. Robot's Speak 'n' Spell is a vocabulary drill laid out like a crossword puzzle, with an illustration for each of the more than 1000 words. Word lists range from kindergarten to college level. Mr. Robot pronounces each word in the computer's voice, provides a definition, and displays a color picture to illustrate it. You then try to spell the word in the given time—not too difficult, as the computer allows you to type only the correct letter.

This good basic concept is hobbled by limited graphics and the computerized voice, which is often difficult to understand. It's frustrating to watch the time run out on a word you knew but that the computer's voice didn't pronounce clearly. Some of our players just typed letters until they accidentally hit the right ones, which the program dutifully accepted.

Because it needs to display a picture of the object, Mr. Robot's Speak 'n' Spell is limited almost exclusively to nouns. This is not a problem in the lower levels, but the higher grade levels quickly run out of useful words, and the program relies on definitions for such arcane or obscure words as pannier (one of a pair of baskets slung across the back of a beast of burden) and biretta (a square cap worn by Roman Catholic clergymen on certain occasions).

Amy's Fun-2-3 Adventure

Outstanding among these four programs, Amy's Fun-2-3 Adventure is a set of well-designed counting games for children of ages two to six. It sports crisp animation, lively sounds, polished programming, and a female (although canine) title character, which is a refreshing change.

Three of Amy's minigames involve counting and number recognition, and the fourth is a computer xylophone that combines music and numbers. Let's Count introduces number concepts by presenting an animation that illustrates the number you select. When you click on 3, Amy might take three drinks of water, bark three times, or watch three birds fly by.

Matching with Marty helps develop number recognition by presenting a number and two sets of shapes. You must choose the shape set that matches the number.

In Cookie Castle, Amy the dog holds up her paws (complete with ten fingers) to display a number. You click the matching numeral on the castle wall to rebuild the wall.

Music Magic is a computerized, single-octave xylophone with numbered bars. You can use the mouse to play it like a regular xylophone, or learn to play a song from Amy's library. The song library shows you the number of the key to strike to play the next note in the song. For budding Mozarts, the screen also shows the note in standard musical notation.

This is a great introduction to written music. Tying number skills to music keeps the experience lively. Although Music Magic is the least elaborate of the four minigames, it is clearly one of the most satisfying.

The manual is well-written, patiently explaining a lot of technical material for beginning computer users—an important aspect that is too often overlooked. We don't like the part of the manual that says that Amy is only allowed to use computers that are old and obsolete, but this is just a minor quibble, as is our dislike

of the CLI-based hard-disk installation routine.

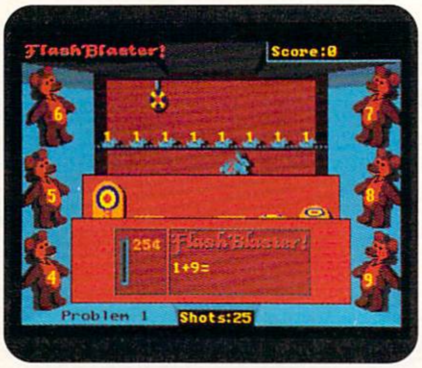
There's a lot going for Amy's Fun-2-3 Adventure. It's a well-executed program that is patient and forgiving of mistakes. The best part is that there are no time limits here. You are free to play any of the games for as long as you choose, without the pressure of failing if you spend too much time absorbed in your own explorations.

FlashBlaster

Although FlashBlaster, a math drill program, looks almost as polished as Amy's Fun-2-3 Adventure, it comes up short because of a few flawed design decisions. The basic idea behind it is solid: You solve math problems and fire on numbers in a moving shooting gallery to enter the answers. In practice, however, the game falls apart.

FlashBlaster is a CanDo deck, reacting more slowly than fully optimized code. On nonaccelerated Amigas, the noticeable delay between the press of the mouse button and the sound-effect bang causes great confusion. You're likely to fire several more shots in trying to hit the mark, thus wasting precious bullets and even more precious time.

If a shot misses its target, the problem is whisked away and replaced by a new one. Because the arrival of the new problem is not accompanied by any audio or major visual cues, you will often continue to concentrate on entering the answer for the old problem. Because bullets are snatched away as time passes, you tend to avoid glancing from the targets down to the problem. Even after you master all the quirks of the game, it is still confusing and frustrating to play.



In FlashBlaster, you shoot the answers to the problems.



The Music Magic game in Amy's Fun-2-3 Adventure teaches number and music skills.

Mathasaurs

Of these four games, only Mathasaurs fails to be even slightly educational. Featuring appealing sounds and exuberant digitized voices, it is a vertical-scrolling game that requires you to shoot endless hoards of alien monsters and run into baby dinosaurs, Babysaurs, to rescue them. You can shoot only forward, cannot go past the left or right sides of the screen, and cannot back up to collect stray Babysaurs. You must continue marching inexorably forward, as the enemies get thicker and more deadly. Some monsters are math problems, always a single numeral plus or minus 1 (7+1, for example). When you shoot an equation, it transforms into its answer, which is spoken by a digitized voice.

The problem is that you never have to calculate anything or even pay attention to the answer. Instead, the equations and their answers quickly dissolve into vague background noise, while your attention is riveted on running, blasting, and surviving. Not only is this not educational, it has a decidedly anti-educational bent. Numbers become enemies, and nothing that constitutes learning is required of a child in solving the problems. Although the answers flash briefly on the screen, it is unlikely that a child would waste precious time attending to the problem or its answer when doing so earns no reward and would very likely result in the player's "death."

The best advice we can give you about buying any educational software for your children is to let them test drive it in the store before purchase. The kids will be able to report very quickly on the merits and frustrations of the game, and this will help you reject programs with obvious problems. Of course, your judgement will have to carry the day, but as children become increasingly computer savvy, they can make valuable contributions to the process.

—Daniel Greenberg and Marliese Colantuno

Continued on p. 74.

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See Page 85 for TOASTER MANIA!

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Circle 10 on Reader Service card.

From p. 71.

TAKE-2

***Rombo*, $99.95**

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 1MB RAM.
Recommended system: 3MB, hard drive.

Pencil-testing and animation presentation

Originally conceived as an animation pencil-test program, Take-2 has matured, allowing the use of any standard Amiga images, four concurrent levels of animation, and sound. You can sequence a series of images into an animation and control each frame's duration.

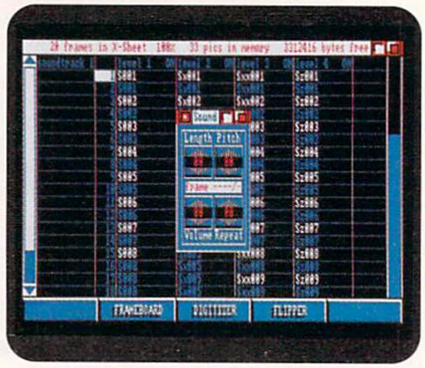
Take-2's main screen, the Exposure Sheet (X-Sheet) is divided into five columns, one for soundtracks, the rest for tracks (levels) of animation. The columns are divided into cells, each of which holds an image or a sound. A memory gauge on the right side gives you a rough idea of the space available, but the exact number of free bytes is also displayed.

PANEL DISCUSSION

While the X-Sheet organizes your project, you must call one or more Panels (icon-filled windows) to do any work. The Picture Panel lists all the images currently in memory, and the Cell Panel manipulates cells in the X-Sheet. The Sound and Sample Panels control the use of sound in the program.

To start an animation, you load previously created images with the Picture Panel. You can load any standard IFF image or animation into Take-2. (When loading ANIMs, the program uncompresses the file into the single frames.) Next, you select the images you want to load into the X-Sheets, including blank frames. The program searches for needed images that are not currently being used. To save memory, use the Cell Panel's cell multiplier, which controls the number of times an image is repeated on the X-Sheet. With it, you can create animations in which each frame is shown more than once (for working on twos and such) or simulate a pause by repeating one image over more frames than the others.

The Cell Panel also controls most X-



Take-2's X-Sheet organizes your animation; the Sound Panel adds sound effects.

Sheet editing, such as cutting and pasting. To easily and economically create ping-pong-style animations, there's an option for pasting the cells in reverse order. The cell editor also contains powerful string-replacement functions, which will find all occurrences of a cell with a specified name or replace all similarly named cells with another selected image. If you make a mistake, undo it by clicking the Track header at the top of the affected column. The only exception to this is with pasting errors, where you must cut the erroneous frames. I found using the Track header as an undo button confusing; I would prefer a dedicated gadget.

Take-2 also supports adding sound to an animation. Soundtracks can have up to four levels, each using its own Amiga sound channel. Take-2 loads 8SVX-format sounds that are 130K or smaller via the Sample Panel. The Sound Panel lets you alter the pitch, length, volume, and number of repetitions of each sound. By varying these sound attributes (particularly pitch), you can often create several different sounds with the same sample. The manual also gives tips on simulating special sound effects, such as echo and flange.

BUTTON BUSINESS

For help with some editing tasks, click the Frameboard button at the bottom of the X-Sheet. A four-frame, quarter-screen view of your animation appears for you to scroll through. The Frameboard is great for locating the exact image for starting an edit or for accurately placing sound effects. Be warned, however, that the Frameboard supports only low-resolution images.

Next door, the Digitizer button lets you import images directly from Rombo's Vidi-Amiga digitizer (see review on p. 60). Unfortunately, the options work only with the Vidi-Amiga. While you can certainly use another digitizing system to grab your images and load them into

Take-2, it would be nice if the program communicated with such hardware directly or at least through an ARexx port.

The Flipper button displays the animation and regulates its speed. A set of VCR-style controls lets you move either continuously or a frame at a time. You can run at 24 or 30 frames per second or in Turbo mode, which will play back the animation as fast as the machine possibly can. Take-2 plays its animations quite close to the settings, even on unaccelerated machines. As always, however, higher image complexity and resolutions can slow down the playback.

When you're satisfied with your work, you can either save each track of the animation individually or save the entire four-level scene. You can also save and print the X-Sheet for reference. The freely redistributable scene player lets you create stand-alone versions of your work.

While Take-2's ability to play up to four different levels of animation at the same time is unique, it is also limited. Each of the levels can have only two colors at most, and such scenes play only in grayscale mode. Multilevel animation is probably best used in pencil testing, where you could have a foreground in one level, a background in another, and two other levels of animation in between.

Clunky Controls

The weakest part of Take-2 is its interface. The various panels, menus and screens are sometimes confusing. Placing icons on one panel that interact with options on another, such as the cell multiplier that interacts with the Picture Panel, make many operations more difficult than they should be. (For example, why is the ability to cut and paste soundtracks located on the Flipper screen?)

The icons themselves are also confusing, often looking alike and usually not suggestive of the commands they execute. Fortunately, the manual offers a pictorial key to all the Panels and their controls.

The documentation for Take-2 is adequate, but could be better organized, as information seems to be scattered about. The tutorials, moreover, are very short and not much more than a listing of the steps necessary to complete the project.

Well suited for pencil testing animations or building simple presentations, Take-2 is quite reliable and did not crash once during my tests. The ability to create pauses and repeating frames without using additional memory is very useful, and the capacity for doing multilayer animations and soundtracks is impressive. There are some outstanding features here; however, the awkward user interface gets in the way of productivity too often, especially when you're learning the program.

—Dave Thomas

MultiTrace 1.0

AltoFirma Software, $89.

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: Same as SAS/C.
Recommended system: Same as SAS/C.

Debugging library for SAS/C 5.1x.

Tired of scattering printfs throughout your code to track down an elusive bug? How many times have you printed "Now I'm in function xxxx" and "Now I'm leaving function xxxx?"

A solution for this tedium, MultiTrace is a debug link library for the SAS/C compiler. MultiTrace is not a debugger; it's a library of debugging functions accessible from your code, allowing you to output printf-style strings, do hex dumps, and pause your program. The output is displayed in a MultiTrace window you generate with another simple call.

The real fun begins when you use the included MakeTrace utility to generate a special macro file for your code files. MultiTrace uses the compiler's preprocessor to replace your function calls with macros that call the MultiTrace library and can track function entries, exits, parameters, return values, and nesting depth. Controls in the output windows let you change execution speed, pause and step through the functions manually, and adjust the range of nesting you want to see as functions are called. Unlike the printf method, MultiTrace has no problems debugging a program with one or more tasks. It uses its own windows, and each task within the program can have one.

Before you can make full use of MultiTrace, you must modify your source. To protect functions when the preprocessor does its macro substitutions, you must surround function names in declarations with parentheses. Fortunately, the MakeTrace utility does this automatically. It also generates function prototypes in this format.

Modifying a source to accommodate a debugging tool may sound extreme, but the process is relatively painless. To make your code aware of MultiTrace, simply add the MultiTrace output window initialization calls, include your MultiTrace macro header file and new prototypes, and define the TRON preprocessor symbol to enable function tracing. Then add one of the MultiTrace link libraries (there are several provided for different math library and addressing setups), recompile your source, and build.

The documentation is a bit sparse, but by looking at the examples and tutorials, you should become familiar with the program in under an hour.

If you use printfs a lot in debugging, especially if you're working on projects that have subtasks, MultiTrace is well worth the money.

—Paul Miller

World Atlas 2.5

Centaur Software, $59.95.

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 512K RAM.
Recommended system: 512K, hard drive or two floppies.

Geography referance.

World Tour Series

Designing Minds, $39 each.

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 512K RAM.
Recommended system: 512K RAM.

Geography games for grades 6–10.

I've always loved maps. I like the things they tell me and the manner in which they lend shape to the world. Why, then, don't these two products interest me more? After all, World Atlas 2.5 and the World Tour series offer maps of varying detail, as well as much geographical information. They are clean and well-developed programs that should be valuable for primary and secondary school students alike. But they just don't excite me.

The World Tour series consists of several modules, each one offering facts and a game about a geographical region: Africa, Australia, Canada, Central America, Europe, India, the Middle East, Russia/Western Asia, South America, and the US. World Atlas 2.5, by contrast, packs the entire world into one program and offers only information, no games.

Pick a Country, Any Country

The point of World Tour is less the information than the game. While the pack-

Continued on p. 78.

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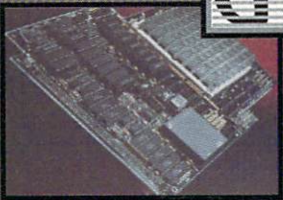
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Circle 13 on Reader Service card.

From p. 75.
age provides maps showing population density, vegetation, January and July average rainfall, and the topography of each module's region, these are simply static maps with good but limited details. Only when you play the game does World Tour really inform.

You can choose to identify countries, cities, the locations of major languages or religions, or the flags of the various countries, states, or provinces. You can play against a human opponent or the computer at nine levels. The spelling-checker option ensures that you spell the names of the places correctly, while the timer can be set to 15, 30, 45, or 60 seconds, or turned off. You can also select how many tries you get to type the right answer (up to three) and whether you must type the answers or click the correct map location. Finally, you can choose to listen to the Amiga's voice or just read the responses on the screen.

Basically, World Tour is a recognition game. After studying the maps to learn the locations of countries, cities, languages, and religions, you play the game to determine how much you've retained. One unfortunate aspect is that some extremely tiny countries (Vatican City and Liechtenstein, for instance) are relegated to insets beside the map, which makes them inordinately difficult to identify. For the most part, however, identification is easy enough, provided you know a little about the area in question.

Where the game shines is in associating facts. In the languages game, for example, you might be asked to click on the country where Flemish is the official language. You have to know that the answer is Belgium and where it is located. If you've selected the bonus rounds option, you must answer a trivia question after each correct identification. These aren't difficult, but at five points a crack (half of the ten you get for a correct first-time identification), they certainly influence the game's outcome. When finished, you can print out certificates for players and quiz sheets for study.

Just the Facts

By contrast, World Atlas is about information only, so it concentrates on making the facts useful and accessible. Screens outline details about the world (size, mass, mineral components, and so on), the time zones, area and population percentages, and special locations, but only the special-locations screen is interactive. Here, click the left mouse button to see the location of the longest rivers, highest mountains, and other features of each continent.

The great bulk of the information to be gleaned from World Atlas resides in its Info Cards. From a listing or a map, you can select the country or state you wish to view. Doing so brings up its Info Card, which shows a small map, the flag, a scrolling history of the area, and a selection of information—the capital, population, area, cities, currency, religion, time zone difference, and unemployment statistics, for example. Such world organizations as OPEC, ASEAN, NATO, and the Commonwealth of Nations are also covered.

It's interesting that all of this information can be edited. For teachers, editing information could be a research project, forcing their students to check the existing statistics and update them.

To enhance the information given on the Info Cards, World Atlas includes several seek functions. You can find a country by knowing only the name of the capital. You can also ask for a list of countries whose population or area falls within a given range, or whose inhabitants speak a certain language. You eventually end up with the same Info Cards as before, but having different ways of getting there is worthwhile. For further customizing, World Atlas supports 110 ARexx commands.

World Tour and World Atlas are well done, can be extremely useful for educators, and do a good job of informing, but I'm not going to toss out my paper atlases just yet.

—***Neil Randall***

Home Front 2.0

***Designing Minds*, $99.95.**

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 512K RAM, two floppy drives.
Recommended system: 1MB, hard drive.

Entry-level financial manager and home organizer.

Home productivity packages should do mundane things efficiently. To that end, Home Front 2.0 offers a number of separate modules: Accounting Manager, Cost Forecaster, Inventory Manager, Recipe Manager, and Address/Phone Manager.

The heart of Home Front is the Accounting Manager, which tracks income and expenses. You can create up to 99 separate accounts (such as checking and savings) and any number of categories (wages, tips, mortgage, petty cash, and so on). An on-screen check image guides you through data input and transactions. To monitor your finances, you can view and print a variety of reports and graphs. This module also enables you to print checks on your dot-matrix printer with the help of tractor-feed check rolls.

Very possibly the nicest module in the package, Cost Forecaster lets you see the outcome of future or existing loans. In just a few mouse clicks, it determines payment required, number of payments, interest rate, and more.

The Recipe and Inventory modules use an index-card metaphor to input and display data and let you devise categories for organizing your favorite dishes and personal property. The Recipe Manager also plans meals and grocery lists.

Finally, the Address Manager uses the idiom of a rolodex (what else?) to list a name, address, phone, and note for everyone you call frequently. Unfortunately, it provides room for only one phone number, so you can't add a work or fax number. The single line for notes is also a bit restrictive, although the two lines for important dates do add a bit of elbow room.

User Hostile

The bottom line when choosing this sort of product is the interface. A poor or ineffective interface discourages you from using the program, and if you don't use it faithfully, you're better off keeping records the old way. Home Front runs under Workbench 2.0, but it supports nary a single 2.0-type feature or convenience. It can't even handle custom fonts on Workbench.

More serious is the interface's dreariness; MS-DOS CGA users from 1986 will feel at home. The main screen is a window that plasters itself on the Workbench screen—its drag bar can't be dragged, and you must use a menu item just to push the program to the back! Even when Workbench is set at 640X400, the program runs as a 640X200 application, ignoring space it could use to save you from flipping screens for more data. Worse still are the nonstandard text-entry gadgets. Objects in the program generally cannot be clicked on for activation; to select an item, you must enter a number that corresponds to it.

The most unAmigatized program I've seen in a long time, Home Front 2.0 is the sort of software that perpetuates the Amiga's bad reputation among PC users. In 1992, we should not be subjected to a program, particularly a commercial one, that looks and acts as poorly as this one.

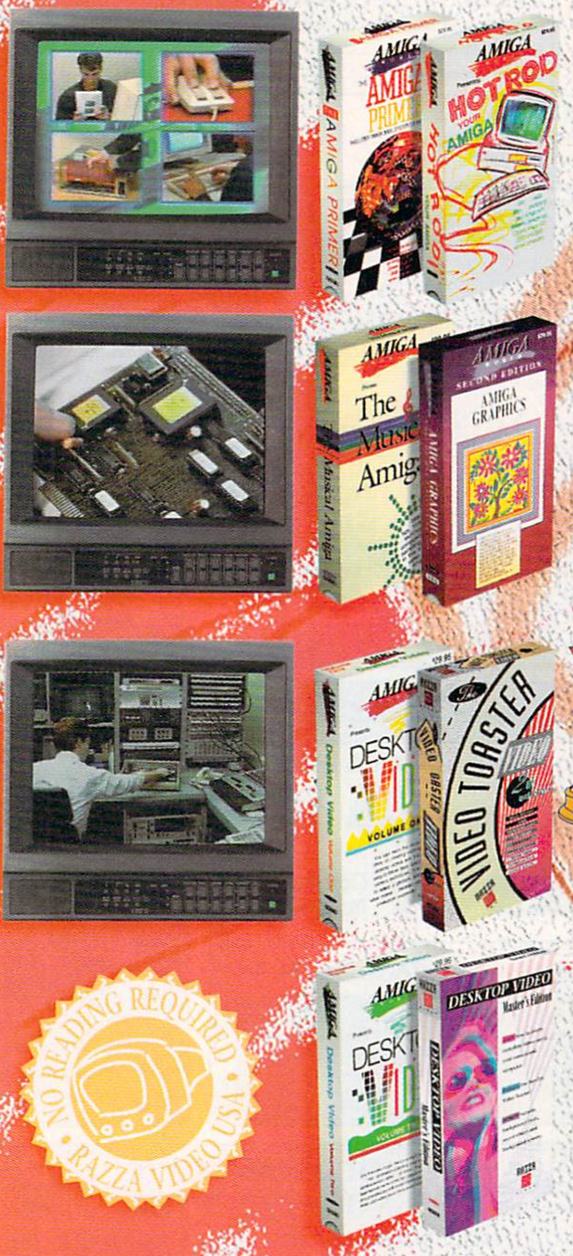
—***Dave Johnson*** ■

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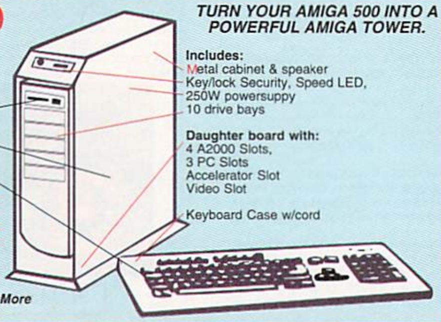
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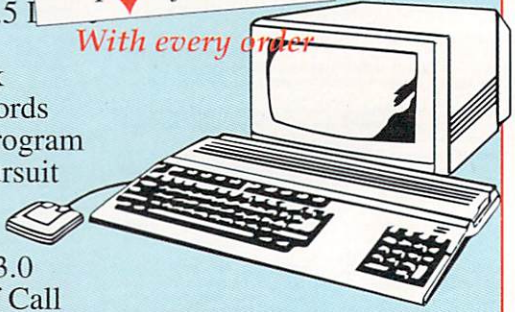
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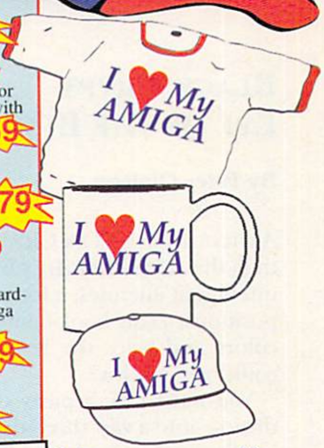
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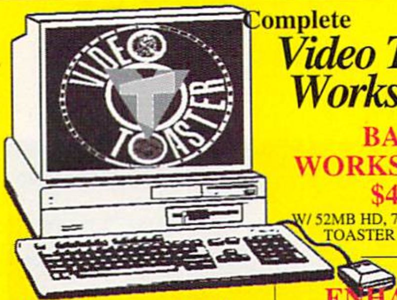
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The Game Preserve

BLACK CRYPT
EYE OF THE BEHOLDER II

By Peter Olafson

AMIGA DUNGEON CRAWLS aren't likely to get much better than this. ***Electronic Art***'s **Black Crypt** ($49.95) offers relatively intelligent enemies, a form of auto-mapping, five saved-game positions, a clue book built into the manual, and four times the colors and twice the levels of Dungeon Master. What more could you ask for?

You must take a party of four—fighter, cleric, magic user, druid—into a vast three-dimensional dungeon to retrieve four magic weapons and send Estoroth Paingiver, your not-so-basic evil cleric, back into the void he's learned to call home. With a little experience, the you-click-on-it-you-bought-it heart of the game will become familiar to those who've graduated from (or died unpleasantly in) DM or Eye of the Beholder.

The graphics are something else: It's absolutely the best-looking game of its type around. BC's cool light comes from the 64-color Extra_Halfbrite graphics. Each of the tiles from which the game was built—doors, gates, columns, niches—looks as if an artist had sweated blood over it, and you'll gawk at the splendor of your surroundings through the first few of the 28 levels.

The lushly appointed, jump-back-startling monsters are not the usual victory-or-death jokers. (They know enough to retreat.) The dusky corridors lead through levels as large as 33-by-35 to a maddening parade of puzzles involving the usual array of pressure plates, teleports, switches, and buttons. (Mercifully, long-lived and cumulatively constructed level maps are available from the Wizard Eye spell.)



In Black Crypt, what you see is what you whomp.

What more could you want? Well, maybe a touch more atmosphere, eh? Black Crypt doesn't use sound nearly as effectively as Dungeon Master, and it sometimes seems almost too gorgeous for the task at hand—more like crossing Mrs. Paingiver's freshly shampooed living-room rug than her son's messy basement workshop.

Eye of the Beholder II: The Legend of Darkmoon ($59.95, ***Strategic Simulations***) isn't quite on the same Claudia Schiffer ►

CRIB NOTES By Peter Olafson

The good news is that once you've weathered the Catacombs of Studio 3 in Elvira II: The Jaws of Cerebus (*Accolade*, $59.95), it's all downhill from there. (Metaphorically, at least. It's uphill getting out of the Catacombs.) The bad news is that we're not out of the Catacombs yet.

The counter-clockwise trek through Level 6 is long and nasty. You'll know you're headed in the right direction if you keep hitting traps and, finally, a sorcerer. Six levels is an awful lot of territory to repeat, so I hope for your sake you have the right disguise on hand to fool him. (To look like the wizardish picture from one of the haunted house's bedrooms, you need the wizard robe from the costume room and stuff from the makeup case.) When he asks where you've been, try the "food poisoning" excuse. It's even true. (Remember the piranha last time?)

That Elvira-like creature in the western reaches of the level isn't Elvira. It's an Elvira substitute—much like the silhouette spotted in that dark hallway off the kitchen—and it turns into something very nasty if you don't kill it pronto. Don't forget to get the Indian's war lance afterward.

Make sure you have a solid inventory of spells and save your game before you hit the surface, for here you'll face the fight of your life from Death himself. (Cerberus knows him from Hell, I guess.) You'll need to launch an Unholy Barrier spell and then start bashing him with your combat spells and *only* spells: Holy Blasts, Fireballs—the works. Don't try to maneuver, however; your magical shield will dissolve.

The Spider Caves of Studio One are next. There's an elevator close to the entrance. Unfortunately, it doesn't work yet. You need a key, and the key is three floors away. While you're sulking, do be sure to turn the elevator on.

Actually, Level One *is* pretty simple—the main feature being the central lake. A rope vital to the game's final encounter can be found at the bottom, but you'll be there also unless you have two spells: Breathe Underwater and Buoyancy. The first you should have coming out of your ears, and if you don't, there are components all over the caves's many rooms. (You must defeat the inhabitants to collect them, however.) Buoyancy, on the other hand, is tricky; it requires herring bones that you can find only in a room in the east portion of Level Four of the Catacombs. (Reader starts cursing a blue streak.) Just as I thought. We'll wait up for you.

Back so soon? Okay, you'll run ►

To locate vendors of the games reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 106.

level of good looks as Black Crypt, but it's a sweet step up from the excellent original game, and has more of that heavy air in which BC is wanting. Its world is substantially larger (including a wolf-ridden forest), the graphics are good to stellar, and the sound is solid. I actually held my breath a few times as I heard footsteps approach in the temple's stoney corridors...and then exhaled as they receded. Whew!

There's no rest for the weary here. Fresh from purging the Waterdeep sewers in EOB, you and your lot have been enlisted to minister to the unwholesome inhabitants of the Temple Darkmoon, where people are disappearing like incumbent congressmen.

It's the usual monster mash—hack, slash, grab, heal, and save—but with many more of the neat touches than I recall from the first game. Lovely stills often crop up for key encounters. Looking at a new-found scroll may summon a graphic inset of a scorched fragment of map. Party members even comment on the lay of the land—be it a curious disarrangement in the bushes or a draft from a wall.

Both these games are superior examples of the genre, and devotees will be happy with either. However, neither feels quite fresh: What used to be something special has become a cottage industry—enough with these DM clones! We've been crawling in square-by-square dungeons long enough. Could I try on something that scrolls, please?

PANZER BATTLES

By Jeff James

IN THE SUMMER of 1941, Operation Barbarossa—Nazi Germany's invasion of Russia—plunged both countries into nearly four years of armed conflict. In a series of battles that ranged from the outskirts of Moscow to the streets of Berlin, the war for the Russian Front helped seal the fate of Hitler's Third Reich. **Panzer Battles** (***Strategic Studies Group***, $49.95) recreates six of these great tank battles.

Instead of moving each unit about the hex-grid map individually, you (and your computer or human opponent) act as a Corps Commander, giving orders to computer-controlled regimental commanders. These units then try to carry out your orders as closely as possible, directing the units under their command—a refreshing change from the norm. If you tire of the six included scenarios, you can create your own, as well as paint your own terrain and units with, respectively, the Warplan and Warpaint utilities.



Following your orders, the Russian 20th Army tries to envelop an invading force of German infantry.

Although it offers pull-down menus and windows, Panzer Battle's interface and file requesters are eccentric—on my A3000, Panzer Battles obstinately refused to recognize my hard drive's WORK: partition. Another sore spot is the game's chunky, 32-color 320×200 screen resolution. Because of it, the program constantly zooms about the playfield to reveal the action on some other section of the map, which can be disorienting. The game also lacks a strategic map option, making it impossible to see the battlefield as a whole.

Panzer Battles isn't copy protected, and an included installation program easily copies it to a hard drive. Although the game was noticeably faster on an A3000, it performs nicely on a dual-floppy A500 (as long as it has one meg of RAM).

While casual gamers might find Panzer Battles too involved to enjoy, hard-core war-game and Russian-Front enthusiasts will find it well worth the effort.

SIX FROM SIERRA ON-LINE

By Peter Olafson

THE EARLY GAMES from ***Sierra-On-Line*** were never known for taking advantage of the Amiga's special gifts. About the

Continued on p. 90.

CRIB NOTES

into a nymph in the lake. Bop it on the head to subdue it. In fact, you can pretty much bop all the routine under-a-large-rock-type creatures in the caves. (The exception is the ants, who have vulnerable tummies and an aversion to certain spells.)

The same hit-'em-in-the-head rule holds for a scorpion who occupies a niche off the western edge of the second level. This critter is guarding a scroll of binding—another essential ingredient for success in your run-in with the top dog. (Sounds as though we're getting close to the end, right?)

The only real trick on Level Three is getting to the exit across that rather imposing empty space. You'll need to cut part of the web, and then use it to swing across. (While you're here, if you feel adventurous, save your game and try approaching the central web from the south.)

Level Four, and lots to do. In your wanderings, you'll eventually come upon a fellow stuck in the spider web. The key to the elevator is in his wallet, but you'll need a Telekenesis spell to loosen it. Yes, it's another one of those horrible one-shot spells whose components are invariably as far from you as possible at the moment you need them most. In this case, the component is the magnet in the radio in the typing pool back in the studio offices. (Reader does best Yosemite Sam imitation.)

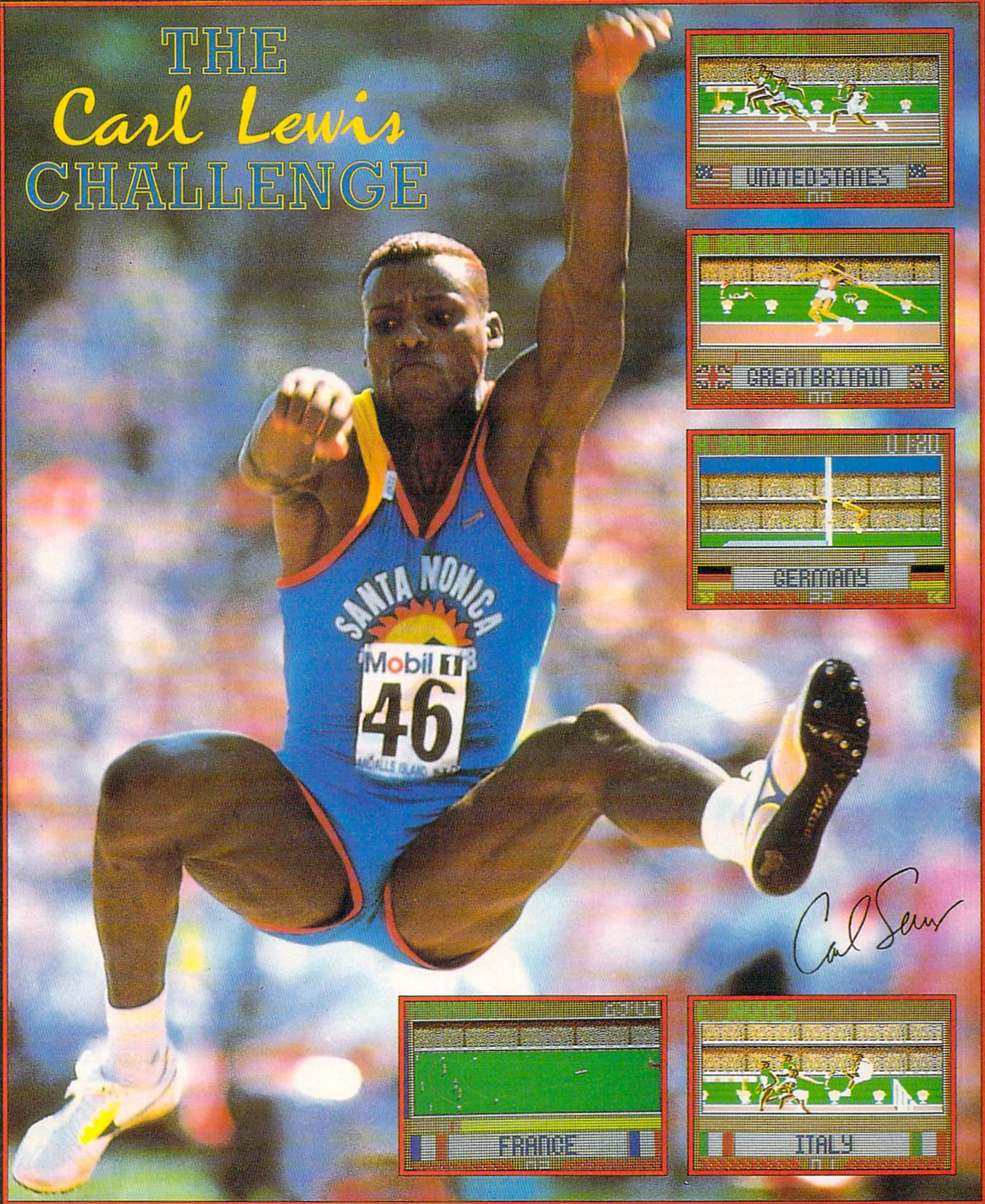
Now you get to tango with the mother of all spiders, who you should be able to spot across the web. You can't kill it, but you *can* trap it rather nicely. Fire an Ice Dart at it to get its attention and, when the spider starts for you, lead it to the elevator and imprison it behind the doors.

By now, you're probably not too surprised to discover that the comely creature you find afterward isn't Elvira after all, but a wasp—a *big* damn wasp. You shouldn't have much trouble stinging it back if you still have a decent supply of high-end combat spells. Take the chief's tomahawk, get back to Level Three and ride the elevator to civilization.

Smells like endgame spirit, eh? So where *is* Elvira, anyway? Well, think of the places where you haven't been able to do much, and it'll come to you. There's the monster in the basement of the haunted house, and the priest at the back of the church atop the catacombs.

Let's tackle the haunted house first. Take the barometer from the foyer, put the copper rod from the studio boiler room on the chimney

Continued on p. 90.



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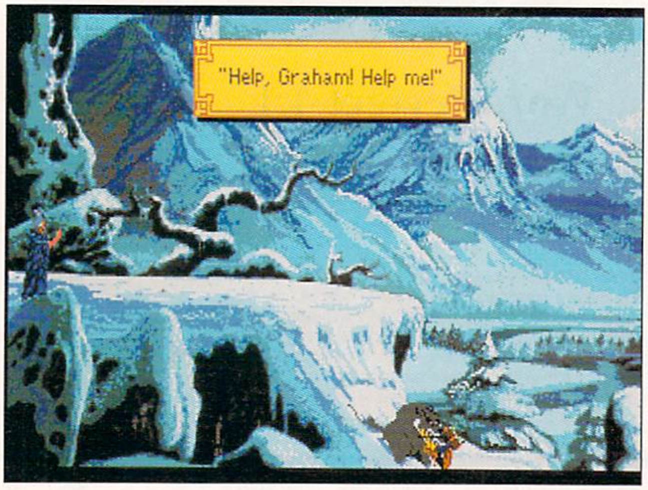
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In King's Quest V, you must find your missing family and castle.

From p. 86.

nicest things you could say about them—besides that they were often fun to play—was that they multitasked.

Times have changed. There is a new generation of games: a speeded-up, bug-fix revision (1.1) of **King's Quest V** ($59.95), **Leisure Suit Larry 5** ($59.95), **Space Quest IV** ($59.95), **Police Quest III** ($59.95), **Castle of Dr. Brain** ($49.95), and a re-release of the original **Space Quest** ($49.95). They don't multitask, but all use 32 colors and a new graphical user interface.

The games themselves haven't changed. They're equal parts treasure hunts and pleasure cruises: Take in the sights, collect objects, and then use the objects to move on to other sights and objects. In Police Quest III, Sgt. Sonny Bonds tries to solve a string of murders. In Space Quest IV, intergalactic custodial engineer Roger Wilco is propelled into past and future SQs in pursuit of nemesis Sludge Vorhaul. Leisure Suit Larry 5 opens with the dweeb in the white suit and Passionate Patty pursuing separate paths—Patty undercover, Larry under covers. And in King's Quest V, King Graham is missing a castle—the one with his family in it.

The games look better. KQ V is simply the prettiest Amiga game Sierra has ever done. Larry 5's out-of-kilter landscape and lively color scheme—like a hip shirt design—are positively jazzy. Police Quest III has fluid and life-like animation (although the characters' faces suffer from being battered down to 32 colors, looking as if they have a nasty rash). The sound's been good for some time now, but I was tickled to hear the digitized voice of a computer near the start of the revamped Space Quest.

Unfortunately, these games are quite slow on 68000-based machines. All except KQ V and Larry V sport a "faster Amiga recommdd" (sic) notation on their product-info stickers, and King Graham and Larry would probably benefit from an accelerator, too. This is something of a puzzle in itself, for it's not as though the Amiga is overtaxed by the tasks at hand.

In SQ IV, Wilco lands a job in a fast-food restaurant, and you have the opportunity to play a burger-assembly arcade sequence. This is the sort of thing at which the Amiga excels, and yet the sequence fairly crawls. When Bonds drives a car in Police Quest III, the car (viewed in overhead perspective in a little window) is the only thing moving on the screen—and the road still ticks by frame by slow frame.

Is play better under the new interface? Using the set of command icons is less frustrating than wrestling with the parser, but it is also less involving. Typing may have been a nuisance, but by the time you were done with a game, you knew every inch of the terrain by heart because you'd tried every verb in the book on every part of it. As long as it takes to play these games because of their first-gear speed, they feel shorter than their predecessors. I'm not saying throw out the interface, but give us more game or more depth to use it with.

I'm not saying you won't have some fun here, either. Police Quest III has more of a real-life edge to it. Space Quest IV is very like its predecessors in some appealingly dumb ways. (One of your first tasks is capturing the SQ equivalent of the Energizer bunny.) And Castle of Dr. Brain is a real departure—the standard adventure system with a first-person perspective, wholly driven by brain teasers. You'll need to win at the memory game Simon even to get in the front door.

Larry 5, regrettably, is a better conversion than it is a game. Larry's three seductions are a throwback to the original LSL, the puzzles are weak, and the game is heavy with automatic sequences. It's not even that sexy.

In all, while Sierra's effort is very admirable, most of these games don't really cut it in the Amiga market. The exception is the new version of King's Quest V. It's gorgeous, it's playable, it's fun, and it's ripe with the seeds of potential. This could be the beginning of a beautiful friendship.

Computer Third Reich

By Jeff James

LEAPING FROM TABLETOP to computer screen, ***Avalon Hill***'s **Computer Third Reich** ($39.95) offers the same sump- ►

CRIB NOTES

From p. 86.

(if you haven't already done so), and, while still up on the roof, use the barometer to launch a Summon Storm spell. Back down in the basement, a little obvious fiddling with the controls brings tall-dark-and-gruesome to life, but a snip or two with your wire cutters turns him off again. Take a close look at his head for useful spell ingredients and also at the room revealed behind him. Yup, that's Ellie herself—the genuine article, at last. Hubba-hubba.

Now get ye to the church on time, and run a little Resurrection number by the dead priest. Explain yourself, and he'll dash off to the parking lot and draw a nice pentacle. One last stop: Get back to the Indian in the studio cellar and have him bless the magic bag, war lance, and tomahawk. (If he's reluctant, you've either been impolitic with him—in which case you can just do everything in the last two Crib Notes all over again—or you forgot to turn over the peace pipe from the study safe.)

Actually, instructions for offing Cerberus are available in the game—did you try the humor section of the library in the haunted house?—but they're a bit on the ornate side. Put the black candles from the hidden altar in the pentacle and light them (matches are in the haunted house's upstairs storage room), and be sure you have the chalice from the same altar on hand. While you're at it, get the magic bag, lance, and tomahawk side by side and visible in your inventory for easy reference.

Save the game, and use the bag to bring Cerberus in from the Void. Throw the Bind Demon spell from Level 2 of the spider caves at him, and when it wears off, spear his middle eye with the lance and nail him in the heart with the tomahawk. Game over, man. Roll credits.

It looks as though *Interplay*'s Out of This World is out of this column. We'll do it next time, and then start on *Origin*'s Ultima VI. Meanwhile, if you're having trouble with a game, you can write me at 25 Belmont Ave., Madison, NJ 07940; on GEnie and Portal at PETEROO; on CompuServe at 74160, 3053; and on Usenet at Peteroo@cup.portal.com. ■

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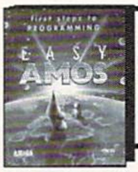
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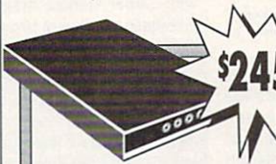
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tuous detail that earned its board-game progenitor a loyal wargamer following.

A cohesive union of military, economic, and political elements, Computer Third Reich (C3R) lets two computer or human players replay World War II in Europe. One player takes the Axis powers (Germany, Italy, and others), while the other hoists the flag of the Allies (Britain, Russia, France, and the US). C3R offers three historical scenarios (accurately recreating the strategic positions of Axis and Allied forces in 1939, 1941, and 1944) and a campaign game (re-creating World War II in its entirety).

To help you along the treacherous path to victory, C3R relies on an intuitive, mouse-controlled interface. The main screen offers a small view of the much larger eight-color, hex-based map of Europe, over which you can smoothly scroll with directional icons. True to its predecessor, C3R displays all military units as rectangular counters, with ratings for movement and offense printed on the front of each. Setting up, moving, and attacking with your units is as easy as clicking on them and then clicking on their destinations.

Not hard-drive installable and having look-up copy protection, C3R operated without any difficulty on both a one-megabyte Amiga 500 and an A3000 running AmigaDOS 2.04. The 19-page manual, however, is a little too brief. In it, Avalon Hill recommends that you purchase the original board game or the book *Gamer's Guide to the Third Reich* for more information.

What C3R lacks in graphics, sound and other amenities is adequately compensated for by a solid, uncluttered playing interface and a healthy dose of gameplay. C3R is definitely built upon a solid foundation, offering more steak than sizzle. If you're seeking a rich strategy game that plays well, consider Computer Third Reich.

CASTLES

By Peter Olafson

THE FOUNDATION OF **Castles** ($59.95) is sound, but after that, things begin to teeter a bit. This medieval fortress-building game from ***Interplay*** permits you, as king or queen, to design a castle from a construction kit of walls, towers, and gates. You then watch from a bank-camera perspective as your orders are carried out by up to seven types of animated castle-building folk. This part of the game is undeniably charming and well executed.

A set of toggleable menus permits you to hire and fire, add features (windows, arrow slits, and boiling oil), assign specific tasks, and control wages. You set taxes, buy food against the possibility of a siege, seek counsel from your advisers, and have your troops dig a moat. The one real lapse in this portion of the game is the absence of sound effects. Without them, it feels as though we're watching clinically from a remote distance.

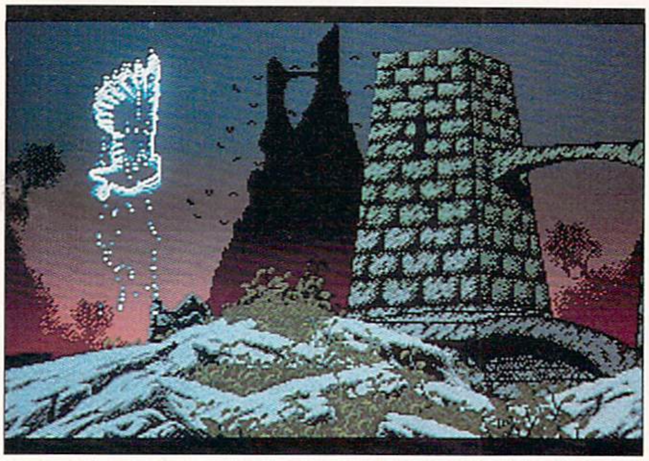
What does bring Castles home is a lively set of story lines. You'll frequently be visited by nobles, churchmen, Celts, and common people, and have to chose among three possible answers to their pleas. Those decisions set the tone for threads that will follow you through the castle's construction and inevitably influence the delicate balance you must strike with different elements of society. There's more to it than appears, and it's a great deal of fun.

The game itself is plenty friendly. It works on everything from an Amiga 1000 to a 3000 and goes on a hard disk. Once the game is installed, copy protection becomes transparent: Answer one question from the manual when you first play, and you're set for life. ►

And yet, Castles's life isn't as long as it ought to be. It's a bit rocky—both as a game in general and as an Amiga game in particular. While very nice graphically, it's also rather slow, bumpy, and unresponsive. Moreover, there's really about two-thirds of a game here. Combat with the Celt raiding parties is pitifully simple—just archers and infantry—even with some enhancements over the IBM version.

Unlike the fortresses you'll build, the game simply doesn't endure. Once you've finished a castle, there's nothing to do except move on to building others under more difficult circumstances. (The game allows construction of one or eight castles, in either real-world or fantasy settings. Sadly, the three-castle campaign from the IBM version has been excised.) That quickly gets old. A Sim City-style taste of life outside the walls would have gone down well. Castles cries out for a more advanced simulation that looks a little farther than the quarry. ■

SHORT TAKES By Peter Olafson



AGONY

Agony ($49.99) is ecstasy. *Psygnosis*' first pure horizontal shooter since Blood Money is bound to be a little slice of heaven for arcade fans. The 64-color graphics are lovely, and the scrolling and music are peerless. You're steering an owl through a primeval landscape inhabited by various owl-attacking sprites—few of them less impressive or detailed than the backdrop—gathering eight spells as you go.

In terms of pure artfulness, this vast fantasy mural has to be the prettiest game Psygnosis has ever laid its hands to. (Will the sequel be called "Owl Be Back"?) And yet this also seems a curious throwback at a time when Psygnosis has sought to broaden its appeal with such games as Armour-Geddon, Lemmings, Obitus, and Carthage.

MIGHT & MAGIC III: THE ISLES OF TERRA

The second Might & Magic episode to appear on the Amiga is one of the best role-playing games you're likely to see this year. Might & Magic III: The Isles of Terra (*New World Computing*, $59.95) offers an expansive and lovely game environment with barely a whisker of difference from the IBM version.

The interface has undergone a makeover—it's all portraits and icons now—and there are all kinds of little finesses that either put information at your fingertips or make using it an unalloyed pleasure. But what's most impressive here is a vigorous sense of focus. M&M II sometimes felt like a game system without a story to give it cohesion. M&M III lets you roam, but also keeps you roughly on track without ever appearing to force you there.

There's a sense of freedom, but also of deliberateness and progression. The monsters aren't infinite in number. The universe is full, but not cluttered.

I suppose you you could see this as the same old kill-the-monsters-get-better-weapons-kill-bigger-monsters game, but it's so splendidly done that I never noticed. Very nice, New World. I can't wait for IV.

THE KEYS OF MARAMON

In The Keys of Maramon (*Mindcraft*, $49.95), you're a mercenary in the monster-plagued town of Maramon. The monsters only come out at night. They retreat into their towers at dawn, and the number surviving your depredations is then reflected in the buildings shuttered for repairs the next ►

THE NEXT ROUND

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NO PIECES TO LOSE—Board-game enthusiasts will enjoy Hoyle Official Book of Games: Volume 3 (*Sierra On-Line*, $49.95). You can play against human friends or any of 18 animated creatures culled from Sierra's graphic adventures. Challenge them to backgammon, Parcheesi, yacht, dominoes, checkers, or snakes and ladders. If you chat with your computer opponents, you'll even learn some of the history of the game you're playing.

ATTENTION, ARMCHAIR PILOTS—Tired of being mouse-bound when you take to the skies with a flight simulator? For a truer cockpit feel, try the Mouse Yoke (*Colorado Spectrum*, $34.95). You simply clamp this aircraft-style yoke to a table and slip your mouse under its elastic strap. Not limited to flight simulators, the Mouse Yoke works with all software that uses a mouse for directional control. Pushing the yoke in and pulling it out simulates forward and backward mouse moves, while turning the yoke left and right mimics sideways mouse strokes.

SPICE IS POWER—Arrakis is waiting for you in Dune (*Virgin Games*, $49.99). As Paul Atreides, you and your family arrive on Arrakis to take over the planet's spice-mining operation from the rival (and evil) House Harkonnen at the Emperor's order. Baron Harkonnen does not give up easily, however. In this strategy adventure that attempts to remain true to Frank Herbert's award-winning novel, you must enlist the native Fremen's help in building your military might to defeat House Harkonnen, while maintaining Imperial spice-mining quotas and, of course, working towards the Fremen's dream of bringing ecological life to the planet. □



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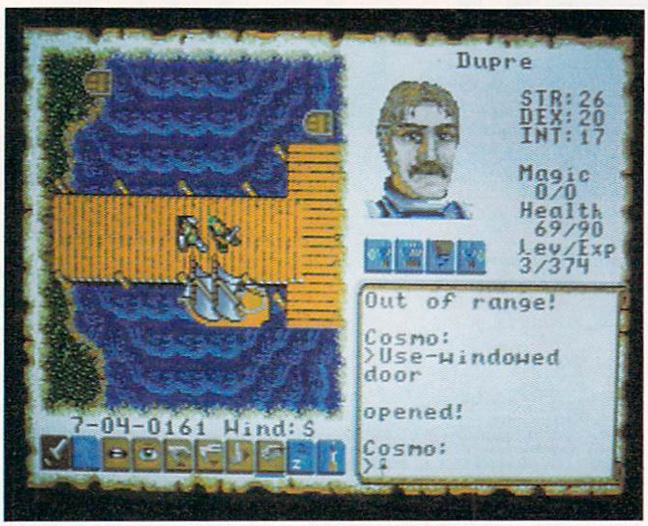
day. If you're consistently good about killing them off, you'll eventually come up with keys to the towers and the labyrinths below. If you're not, you'll dig yourself a nice little hole.

Maramon doesn't have much depth, but there are some nice elements here, and I've no doubt it could make a charming, if light game. But this is very much the sort of half-hearted Amiga port we were seeing three years ago. The music and sound consist of creaky boops and beeps. The graphics aren't even up to the EGA resolution in which the game was originally released. The scrolling is sluggish, and I found the screen shuddering uncontrollably in certain situations. Sorry, but avoid.

HOI

I've had arcade games featuring cute characters up the wazoo, but maybe I have room for just this one more. His name's Hoi, and he's the featured performer in *Hollyware*'s eponymous five-level platform game ($39.95) set in the Madlands: a landscape full of springs, conveyor belts, spikes, slippery surfaces, insects, and other hazards that do not love a cunnin' little green critter with a taste for jewels and fruit. In other words, it's very much a Super Mario Brothers/Sonic the Hedgehog-type game, and it's a very good one.

More could have been done with the main sprite, certainly. He just sort of throbs, as though turning invisible pedals. However, Hoi's scrolling is silky smooth, and the game is full of little Amiga refinements: an Eric Schwartz-like intro animation, a dithered sky with stars whizzing by, a hot palette, and a nifty explosion of circles when Hoi meets his maker. And while I didn't find any of the secret areas that traditionally grace these games, there's always the hint of something interesting just out of sight.



ULTIMA VI: THE FALSE PROPHET

Ultima VI: The False Prophet (*Origin Systems*, $69.95) should begin to redeem the widespread disappointment with Ultima V: The Crummy Port. Once again, you're the Avatar—that famous eight-virtue guy—summoned back to a Britannia threatened by gargoyles who've come up from the Underworld from which you rescued Lord British in U5.

The heart of this new-look Ultima is essentially the same. You and your traditional Ultima band roam around exploring, performing quests, talking to people, and killing monsters (though, pleasantly, there appear to be far fewer of the last). A big difference is that, for the first time, the outdoors, interior, dungeon, and combat sequences all use the same closeup, overhead perspective, with each party member appearing individually and in some detail. Commands are now icon-based, there's a point-and-click graphic inventory, and conversations are more elaborate than ever. Britannia is a more intimate and real place than ever before.

The detail is staggering; takable objects are everywhere. The in-game graphics are right up to the level of the VGA original, and the music is superb.

So what's not to like? Well, on a 68000-based Amiga, it's very slow—slow to the point of did-my-machine-lock-up ponderousness when something's happening nearby—and that's a substantial failing. You'll need to be extra-emphatic with your key presses to get commands to take. The product-info sticker reports that it can be installed on hard disk only on machines with 1.3 ROMs, while in fact it can be installed manually on 1.2 machines.



HILL STREET BLUES

Better late than never, I suppose. Hill Street Blues ($39.95), based on the much-honored (and now rather dated) TV series, has been brought over from Europe by *DigiTek*, and it's not without charm.

That charm doesn't rely purely on affection for the show, but also on the large and detailed city under your protection. Driving your black-and-white in overhead perspective, you'll see an astonishing variety of buildings, trains coming and going, cars thronging the streets (and occasionally getting snarled up and honking at each other), and pedestrians.

Of course, some of those pedestrians have done wrong. You'll use an extensive set of icons to investigate crimes, identify suspects, and put them away. Major crimes go to trial—and you'll have to testify in court. There's a lot of detail here. It's quite tricky getting around at first, however, and you'll need time to get comfortable with the system.

WILD WHEELS

Playing Wild Wheels (*Ocean*, $49.95), a soccer-with-cars game, is a bit like being a bug inside a pinball machine. You're leading a team of bumper cars battering a huge steel ball around a playfield. If you do well, you earn points toward better cars for use against tougher opponents. You know the routine.

This isn't nearly as polished as Speedball 2, but it's a lot of basic, well-done fun—abetted by some nice touches in the playfield (such as special tiles) and an option for play on linked computers. The games speed right along—there's no goalie—and the controls (the joystick) serve well.

I do wish it had some league amenities—it's much more an arcade game than a future sport—and that it would run on hard drive so it wouldn't honk the disk at every opportunity. Meanwhile, I'm in the second division, climbing and enjoying it. ■

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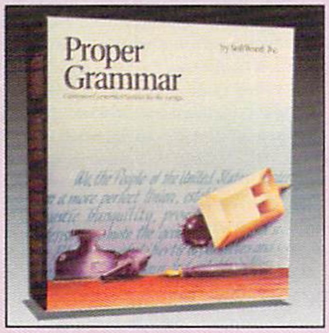
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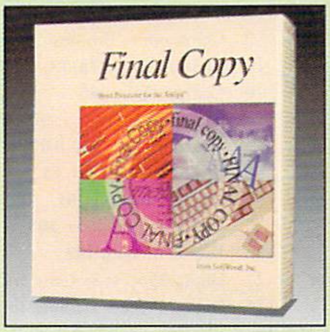
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GUARANTEE - We believe so strongly in our product that we offer a full *lifetime*, complete satisfaction guarantee. No questions asked.

We have been the official Public Domain Library of all the best Amiga magazines. Find out why these magazines choose us! **Each of our disks are jam packed with only the best programs--no "one program per disk' here...compare this to our competitors--*please!*** Almost all of our software is made and written in the USA for easy compatability with American machines. The first two letters on each disk indicate the orientation of the disk; WB# general interest - most programs can be run from the workbench, FD# games and entertainment, VO# are video related programs/utilities and DD# advanced--requires thorough knowledge of AmigaDOS/CLI. *Thanks to our extensive arsenal of anti-virus software, ALL of our software is guaranteed virus free!*

BEST SELLER

DD79abcd: Amiga "C" Tutorial - This is the most comprehensive C language--*Amiga oriented*--set of tutorials available. Includes full working examples, source code and an incredible set of lessons. Included are full discussions and examples on every topic on Amiga programming. 4 disk set, counts as 3.

NEW DISKS

VO9: 24-Bit - Contains Rend24 which allows you to proof Toaster-generated 24-bit animations. Also contains utils to convert IFF's to IBM VGA/Windows readable format. Also contains latest release of JPEG file compressor .
VO8: CompuGraphic Fonts - Contains 2 clipart-style fonts and 4 actual typefaces for use with WB2.04 and it's Fountain utility. Great for desktop publishing and/or video projects.
VO7: StarTrek Objects - Contains the USS Reliant, NCC-1701D (the Enterprise from Star Trek:TNG) and a Ferengi Marauder ship. Also contains a fully detailed Porsche 911 and Apache Attack Helicopter. Imagine format.
VO6: Modelling Objects - Contains 20 vector objects in Imagine format. These are perfect for use with VO5 or your favorite 3D modelling program. Includes Amiga 3000, space station & many more!
VO5: Modelling - Vertex allows you to create 3-D objects without using the abstract X, Y and Z views. Loads Sculpt-3D/4D, Turbo Silver, Imagine, LightWave, GEO and Wavefront formats. MagicTween will metamorphasize any two pictures by automatically animate the "in-between" frames.
V04: Video & Anim - Video_DB will catalog all of your videotapes. Slate is a sharp graphic of a slate for your productions. CyroUtils splits, makes and gives info about ANIMs. RTAP lets you play large ANIMs on small memory machines.
V03: Image Utils - let VideoToolsOnTap let you tap into the video power of your Amiga for fades, color and greybars as well as a plethora of other indespensable video functions. TitleGen will do professional crawling titles. JPEG converts JPEG<->24-bit IFF with amazing compression. ImageLab performs special effects on IFFs.
V02: Stillstore - Used to create the "over the shoulder" graphic inserts ala the 11:00 news.
V01: Graphics - Picbase will let you view and track ALL of your IFF pictures over all of those floppies! Freepaint is a Deluxe-Paint workalike. Agraph is a powerful utility to produce snazzy graphs.
FD80: Technoban - If you like logic puzzles, this disk is for you! Create your own puzzles with the built-in editor or play the many pre-made ones. Requires Fat Agnus (1MB of Chip memory).
FD79: Addams Family Quiz - They're delightfully creepy and spooky and now they're in your Amiga! Classic digitized graphics and sound samples make this a real crowd-pleaser. Wait till you "talk with Cousin Itt!"
FD78: Potpourri - Lothian is a great Ultima-type adventure game with great graphics. Rocky is a remake of the classic Boulderdash.
FD77: Arcade Series - Galaga'92 is a clone of the arcade game of the same name with several gameplay enhancements--with smooooth, sharp graphics, it's better than the origional! Pharaohs Curse is a clone of the origional C64 classic. Diplomacy is a beautifully computerized version of the Avalon Hill board game--conquer or be conquered! Galaga requires 68020+
FD76: Catacomb - is a full graphic adventure game with beautiful graphics and a very slick icon/mouse driven interface.
FD75: Arcade Series - Descender is a clone of the classic arcade game "Tempest"; complete with vectorized graphics. Tanx is the classic battle of trajectories and inertia between two tanks—incredibly well done! Search is a maze game unlike any other—included is a level editor too. (Tanx requires 1 meg chip memory=Fat Agnus)
FD74: Arcade Series - RingWar is an "Outer Limits" clone with vectorized graphics. MotherLode is a "Lode Runner" clone with 50 levels! In BlitzTanks, they're coming at you from all directions!! Call in air strikes and use your heavy artillery to survive!
FD73: Arcade Series - Intruder Alert! is a MULTI-level "Berserk" clone. Features smooth gameplay, great graphics & digitized sound f/x.
FD72: Sword of the Warlock - This is a demo version of a great public domain graphic dungeon adventure game. The adventure spans three diskettes and allows two players to go adventuring. The game has a 'Bards Tale' feel to it. Three disk set, counts as 2. Requires 1 meg of RAM and 2 floppy drives or HD.
FD71A&B: Star Trek: TNG Trivia Challenge - So you think you know The Next Generation, huh? Complete with fantastic sampled sounds and digitized images, this game even looks and sounds like a genuine Star Trek terminal! VERY thorough and complete! Counts as 2 disks.
FD70: SpaceGames - Contains AmiGoids, >finally!< an Asteroids game that takes advantage of the Amiga—totally configurable with great sound and grpahics. In Cosmostruction the object of the game is for each Cosmostruction team to acquire the most points while construction energy ducts between the space station and planetoids.
FD69: MindGames - Had enough of shoot-em up games? Relax and let these 21 games exercise your mind instead of your wrist.
FD68: Potpourri - Eternal Rome is a strategic simulation of the Roman Empire including military, diplomatic, political, economic and social factors. Lord of Hosts is a board strategy game for 2 players. In Moonshine, you've got to get the hootch across the state line—a great rolling, scrolling driving game!
FD67: Arcade - Includes Llamatron a well-done 'Robotron' clone. Hate is a "terrific" commercial grade Zaxxon clone with multiple levels/worlds and smooth diagonal scrolling...a 10!
FD64: Games - Wizzy's Quest - a "great" 50 level game with great graphics, Cubus - a 3-dimensional Tetris type game (rotate and move in 3 dimensions). Husker Du - Colors and pattern rather than shape in this Tetris-esque game; 5 screens and 3 levels of difficulty. Requires Fat Agnus (1 Meg of Chip)
FD62: PomPom Gunner. An extremely smooth and well done World War II gunner simulation. Requires 1 megabyte of memory.
WB117: Religion - Contains Scripture_Mem (aids in memorizing verses and passages) and in Pauls Journey, you are Paul of Tarsus exploring the Mediterranean and preaching just as Paul did. Req. 1 MB RAM.
WB116: Databases - This is what you've been waiting for! Contains 5 uniquely specialized dtabase programs for tracking: Videotapes, CD's, Magazine Articles, Comic Books and Trading Cards!

SPECIAL PRODUCT!

QT1: THE A64 PACKAGE - A very complete Commodore 64 emulator. Supports any CPU and is fully compatable with WB1.3 & 2.0. This version includes a special adaptor that will allow you to connect your 64's 1541 disk drive to your parallel port of your Amiga for total emulation. Two disk set, counts as two. Special price $49.95 - including hardware.

WB115: Term - If you have AmigaDOS 2.04 and a modem, then this is *THE* program for you. Term *totally* conforms to the User Interface Style Guide for 2.04, has an ARexx port, and supports all popular file-transfer protocols through XPR libraries. We wish all programs were written to this caliber.
WB114: Fonts #4 - Contains 36 bitmap system fonts.
WB113: Sid II - Why pay 40 bucks for a directory utility, when this one will do it all plus much more! A truly professional-caliber program. Sid 1 was our best, now *completely* rewritten, Sid 2 will undoubtedly astound you.
WB112: Productivity/Business - Stock Analysis allows automated downloading of stock data with full analysis capabilities (requires modem). SubStore will allow you to log magazines and articles with full search/scan/print capabilities.
WB111: Cellular Automa - Straight from the pages of the January 1990 issue of Scientific American, this electronic model will allow you to simulate cellular circuits.
WB110: Electronic Baby Book - Immortalize your children on your Amiga! Tracks everything about your newborn—first steps, words, tooth, birthdays, X-mas, friends, etc—even space for a digitized photo!
WB109: VerseWise - Display, search and output The New Testament to text files or your printer.
DD86: The Programmer - Includes GadTools and REQTools which will allow you to create your user interfaces and then the program will automatically generate "C" source code or Assembly-code--saving you countless hours of work! Requires, and writes code for, AmigaDOS2.04.
DD85: AnalytiRIM - Tis incredible program is a combination of a powerful spreadsheet and a Relational Information Manager (database). Not for the faint of heart, this is a heavy-duty package! Req. 1 MB RAM.
DD84: Proteus BBS - This disk contains the full-blown version of the Proteus BBS software. Totally configurable & ultimately powerful. Requires a hard-drive, ARexx and at least a meg of memory.
DD83: IBM - Not one, but *TWO* IBM emulators that will allow the running of MS-DOS software *with* Amiga programs!!! Comes complete with programs to turn your Amiga floppy drives into 720K IBM compatable drives.
DD82: Unix - Contains a working demo of Minix - a Unix workalike. Minix is system call compatable with V7 of Unix.

FUN DISKS

FD5: Tactical Games - BullRun - a Civil war battle game, Metro you play the role of a city planner. Build wisely and your system will be a success, but poor planning will lead to disaster and financial ruin. Very very habit forming.
FD6: GAMES! - This disk is chock full of games including; Checkers, Clue, Gold - A new slide the pieces puzzle, Jeopard - An enhanced version of Risk, RushHour - Surprisingly addicting, and SpaceWar - Best described as a cross between Combat-Tanks and asteroids.
FD7: Pacman - This disk contains several pacman type games including; PacMan87, MazMan and Zonix.
FD9: Moria -. This has great graphic controls, multiple spells, similar to Larn and Hack. Play time several weeks!
FD10: HackLite - A dungeon adventure game. Considered a must-have classic. This is the second release of this game on the Amiga. Great graphic interface. Play time several weeks!
FD11: Las Vegas and Card Games - Las Vegas Craps - The best Las Vegas Craps simulation every written for any computer. Contains extensive HELP features, Also Thirty-One,VideoPoker and more.
FD12A,FD12B: Star Trek, The Game - This is by far the best Star Trek game ever written for any computer. It features mouse control, good graphics, digitized sound effects and great gameplay. Counts as 2 disks. Req. 1Mb and two drives (or hd).
FD13: Board Games - contains multiplayer Monopoly, Dominoes, Paranoids, and others.
FD14: Dungeon Master Hints and Arcade Games - DM maps, spells, item location, and hints and more, also on this disk, Hball - an arkanoid/breakout type game, Trix - a Qix type clone.
FD17: Educational Games - This disk includes several games for the younger members including geography, math, science, and word games, also includes Wheel of Fortune.
FD20: Tactical Games - MechForce(3.72); A game that simulates combat between two or more giant, robot-like machines. Simple words can't begin to give you the feel of piloting a 30 - 40 foot tall, fire breathing, earth shaking colossus that obeys your every whim.
FD26:Arcade Games - Marble_slide is a commercial quality game—similar to a Lucas game named PipeDreams, excellent playability and entertainment. Mutants—a small version of the same arcade game. SuperBreakout is a Pong/Arkanoids type game.
FD27: Arcade Games - This disk is loaded with some great games. Includes, Raceorama a great racing car game with ten different courses, MiniBlast a helicopter gunship type clone, Shark in the same class as froger, and SBreakout the original breakout with more.
FD29: Shoot'em up's - WWII - you're the pilot of a WWII plane flying through enemy territory, you've just been spotted, good luck on you mission, SpKiller - try and penetrate enemy lines with this game, and Retaliator - another great game.
FD31: Games! - Air Traffic Control - a good ATC simulation, Black Jack Lab - a full featured set of card games, ChessTel - play chess with your friend in distant and remote places with this game and a modem, labyrnth - a well done text adventure game (like an infocom game), and MouseTrap - a 3d maze game.
FD32: Flight Simulator - An instrument flight simulator for a DC10.
FD33: Arcade Games - Ffreddy a Mario Brothers type of game, Gerbils a target practice game, PipeLine a German interpretation of Pipe Dreams, Tron a light cycles version, and Wetroids a wonderful version of asteroids with a hilarious twist.
FD35: Omega (v 1.3) - A new outstanding dungeon and outdoors adventure game in a similar vein as hack, rouge, and moria. This version is considerably faster and better that all previous versions. Play time several weeks.
FD37A&B:Tactical Games - Empire (2.2w) This great game comes highly recommended. With a full-graphic front end.
FD38: Games - Cribbage Master - A great cribbage game and tutor, Spades - a well done card came, ChineseCheckers - A computer version of this classic, Puzz - a slide piece puzzle game and construction set.
FD39A&B: Star Trek, The New Generation - This is a, completely different version of Star Trek than that found on FD12. This one was created by the German author Tobias. Now with English instructions. Excellent!!! Counts as two disks. Requires 512k
FD44: Game - Mechfight is an out of this world role-playing adventure comparable to hack and moria. The setting, interplanetary colonies and space stations. In your quest to explore the world, take time out to liberate bad guys of their most valuable possessions, engage in a mortal combat or two against robots and alien life forms, pick up a new Amiga 9000. Most of all, don't forget to stay alive...
FD49:Chaos Cheats - This disk contains an everything you wanted to know about cheat set for Chaos Strikes Back, including full maps, spells, object locations, super characters and more.
FD50: Submarine Game - Sealance, one and a half years in the making, this is an outstanding submarine tactical game. Commercial quality, highly recommended.
FD52: Classics Games - PetersQuest a well done Mario brothers type of game, Jymbc a two player missile command clone, and Vstank a tank commander game.
FD53: Great Arcade - On this disk is a wonderful implementation of the ever popular classic arcade game Defender. Also contain Air Race a WWII flying ace arcade game, and Psycoblast new creation idea game.
FD56: Arcade - Includes SpaceWar. HueyRaid is a well done helicopter arcade game. PowerPong's a great expanded pong game.
FD57: Arcade Games - Includes 2 truly commercial quality games. MegaBall, an Arkanoid-ish game, features 5 musical scores, multiple levels and addicting gameplay. Gravity Attack is a psychadellic trip through several different worlds—each distinctly different.
FD58: GAMES! - Includes Steinschlag; a great Tetris clone from Germany with music. SCombat: simulate battle between up to 40 players & monsters. Imperium Romanum: Battle up to 4 players for control of the Mediterranean in this Risk-esque game.
FD59: Game Potpourri - Xenon III is an almost exact clone of the commercial game of the same name...a great shootemup. Crossword will take lists of words & automatically generate word-search puzzles for any Epson compatable printer.
FD60: Games - In Nebula, race over a 3d world to destroy enemy installations. Interferon; a great Dr. Mario clone. Enigma; is it a gameor a puzzle?
FD61: Games - Solitaire; great graphics, plays two versions. Klide; an interesting piece of eye candy. Extreme Violence; 2 player kill or bekilled game. YATC; A Tetris clone with Artifical Intelligence. Genesis; create realistic 3d fractal worlds.

WORKBENCH DISKS

WB4:Telecommumnication - This disk contains several excellent pd communication programs designed to get you on line quickly and easily. Access (1.42) - A very nice ANSI term program based on Comm v1.34, but with the addition of several transfer protocols, Comm (1.34) - Latest version of one of the best public domain communications programs ever made on the Amiga. Handshake (2.12a) Handshake is a Full featured VT52/100/102/220
WB5: Fonts #1- Several fonts (35) for the Amiga, also included are five PageStream fonts,and ShowFont - a font display program.
WB6: Fonts #2 - ShowFont(4.0) This program allows you to quickly and painlessly view all 256 characters in a typical font. Large AmigaDos system fonts (many up to 56pts).
WB7: Clip Art - This disk is loaded with black and white clip art. Art includes, trees, watches, tools, US and State maps, and more.
WB9: Icons - Truly a multitude of various types and kinds. Also includes IconMiester, IconLab, and others great utilities to help generate icons.
WB10: Virus Killers - The latest and best VirusX(4.0), Kv(2.1), and ZeroVirus III.
WB11: Business - Clerk(4.0), finally a full featured business accounting PD program for the small to medium company. Includes receivables, payables, end of month and uch more.
WB12: Disk Utilities - This great disk is loaded with wonderful utilities for everything including making disk labels, disk cataloging, disk optimizing, disk and file recovery archive and organizing, and all sorts of file manipulation. A must have!
WB13: Printer Drivers and Generator - over 70 different drivers, and if these don't do it, with PrtDrvGen you can make your own.
WB15: Business - This disk contains a spreadsheet, a database, a project/time management program and financial analysis (stocks).
WB16: Business - This disk contains an inventory manager, a loan analysis program, a great calendar/scheduler, a rolodex program, and pennywise a good "Cash Book" accounting for home or office.

WB18: Word/Text Processors - This disk contains the best editors. Includes,TextPlus (v2.2e) a full featured word processor, Dme(v1.35) a great programmers editor with strong macro features,TexED(v2.8) an enhanced Emacs type editor, and a spell checker.
WB20: General Interest - DiskSalv V1.42 a disk recovery program for all Amiga file systems, FixDisk V1.0 another file recovery program with features DiskSalv doesn't have, 3DLook gives a 3D appearance to your WorkBench, Clean V1.01 a program to de-fragment memory, Tracer - trace any part of an image.
WB22: Fonts #3 - Several more great fonts. These, like the other font disks work great with Dpaint and WYSIWYG word processors.
WB23: Graphics and Plotting - Plot (20b) a three dimensional mathematical function plotter. Can plot any user defined function, BezSurf2 - produce awesome pictures of objects one could turn on a lathe. Can also map iff image files onto any surface that it can draw. Now compatible with most 3D packages, and VScreen - makes a virtual screen anywhere, great for DTP!
WB25:Educational - On this disk are two programs that can generate maps of differing types, World Data Base uses the CIA's data base to generate detailed maps of any entered user global coordinates. Also Paradox a great demonstration of Albert Einstein General Theory of Relativity.
WB26: Disk Utilities #2 - MrBackup, KwickBackup - two well done utilities to do harddisk and floppy disk backups, FileMast - a binary file editor, Labelprinter - Disk label printer with very powerful features.
WB27: Nagel - 26 Patrick Nagel pictures of beautiful women.
WB29: Graphics and Sound - This disk has several different Mandelbrot type programs for generating stunning graphics. Includes, MandelMountains - a realistic terrain generator, Fracgen - generated recursive fractals from user input, Mandelbrot and Tmandel - two fast mandelbrot generators, also Mostra - the best IFF display program to date, will display ALL IFF's including Dynamic HAM, and Sound - a great IFF sound player, will play anything.
WB33:Circuit Board Design - several terrific routines for the electronic

KAO 3[1/2]" Blank Diskettes DSDD

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enthusiast, Including PCBtool - a circuit board design tool, LogicLab - circuit logic tester, and Mcad (1.26) a well done new release of this PD CAD program, now comes with predrawn common circuit components for insertion into schematics.
WB34: Utilities - Several well done utilities, some will require moderate knowledge of a CLI or Shell for setup, Chatter Box - this one will play any user defined sound after any event (ie. disk insert, mouse click, disk removal...), , Artm - The Amiga real time monitor, gives you full control of the Amiga OS, very powerful program, Helper - help program to make learning the CLI easier, and more!
WB35: 3D Graphics - This disk contains several neat programs to use with your 3d modeling/raytracing programs 3dFonts - Full vector font set for use with 3d programs, FontMaker - make 3d fonts from any system font, Make3DShape - create 3d shapes from any image, DumptoIFF - create 3d animations preserves pallet, and World3d - a demo program of a front end for use with DKBRender.
WB36: Graphics - On this disk are several programs to create stunning graphical images including, MPath - creates swirling galaxy images, Roses - produce an unlimited number of variations of images that a symmetrically similar to a rose, SimGen - display those spectacular images as part of your workbenck screen, and RayShade - a very good raytracing program, create your own beautiful 3d graphic models with this one!
WB37: Educational - Educational games and puzzles that cover math, geography, spelling, and books. Ages 6 - 15
WB38: Plotting and Graphics - Plotxy is the most powerful full featured plotting package. Used by many colleges and universities. A welcome addition to our library! Highly recommended. Plans - a incredibly well done Computer Aided Drafting program, very full featured. Tesselator - a program that helps generates fantastic looking, recursive M.C. Ecsher type pictures.
WB40: Music - "CD on a disk", 90 minutes of modern music on this well presented collection. Requires 2 drives or HD.
WB41: Music - MED an incredibly well done, full featured music editor. Create your own stunning music directly on your the Amiga. Similar to SoundTracker but better. Very powerful easy to use program. Version 3.20, which is compatable with WB2.04.
WB43: Business - This disk contains AnalytiCalc - probably the most powerful spreadsheet program on the Amiga. A full featured spreadsheet with many features expected in a commercial package. Requires 1.2 MB of memory!
WB46: Clip Art - HighRes clip art with the following motifs - embellishments (borders, dodads ....), people, and transportation.
WB47: Clip Art - HighRes clip art with the following motifs - hair, drafting, summer, animals and macfood.
WB48: Clip Art - HighRes clip art with the following motifs - Holidays, music, medical, and misc.
WB49ABC:Animation Sampler - On this three disk sampler set (counts as two disks) are some of the best animations that have been created over the last three years. Several examples of "Movie" type animations some with spectacular raytraced reality (coolroby, watch, spigot and egg). Also several european style or "Demo" animation with incredible graphics and outstanding electronic music (akrilight, copersine, doc, dps2010, impact, and logodemo). These truly show off the creative edge of an Amiga!
WB50: Animation - Seven of the best european style animations or "Demos", including - scientific 451, subway (a U.S. entrant, also our favorite), sunride, thrstdemo, tnight, waves, and woow.
WB53: Graphics - Raytracing programs generate absolutely stunning realistic looking planes, rockets, buildings..., and surreal images often consisting of highly polished spheres and objects. C-Light is the most powerful EASY-TO-USE of it's kind we have seen to date. This is easily better, and more full featured, than similar commercial programs costing in the hundreds of dollars. Also, sMovie - a full featured video text titler similar to ProVideo, Broadcast Titler. Great video scrolling, wipes, special effects, and more...
WB54: Printing - This disk contains several routines to help with the chore of printing. Includes Gothic - Finally a Banner printer for the PD! PrintStudio -a well implemented all-purpose printer-utility with a very comfortable graphic interface and many advanced features, Lila - with ease, print ASCII files to a PostScript printer, and many more.
WB55: Application - XCopyIII - a full featured disk copier, make backups of copy protected disks. RoadRoute - find the quickest route from one city to another, highway description included. Diary - a diary program like "Dougy Howard M.D", Cal - a calendar program, Magman - a database tailored to maintain records on articles and publications.
WB57: Animation - This disk has several "Demo" style animations, Including, Blitter, Lolly, Sun5, vertigo, vortex, and xenmorph.
WB61: Intermediate Utilities - Includes programs to help to drasticaly decrease flicker in interlace and hi-res modes (antiflick), an Atari-st emulator, an eprom programmer, turn your amiga into an eight channel digital data analyzer or ocilloscope, and more.
WB62: Midi Utilities - Several useful midi utilities including, programs to transfer to and from several music programs to midi, a midi sysex handler, a midi recorder with timebase, display midi info, file sequence player, and a few scores.
WB63: Disk Utilities #3 - Several highly recommended programs to aid in removing duplicate files from your hard drive, performing file backups, Binary editing, fast formatting, file recovery, disk track recovery, and forced DISK VALIDATION of corrupt disks.
WB66: Icons #2- Lot's of neat icons. Also, several wonderful programs that to let you create your own icons, modify and manipulate icons and info structures.
WB68:Music Utilities - several good utilities for the Amiga music enthusiast. Includes, Noisetracker - a great music creation program, Sonix2MOD - converts sonix to .mod files which then can be used by noisetracker, soundtraker, and MED, SpeakerSim - a speaker design tool demo, Wondersound is an additive harmonic instrument design tool with a separate envelope design window and 16 relative harmonic strength and phase angle controls.
WB69: Music - This disk has over 90 minutes of classical and modern electronic music for you Amiga.
WB70: Desk Top Pub - Atcp - transfer Macintosh screen fonts, Mac or IBM format .AFM metric files, to Amiga screen fonts and PPage .metric files. With this program, open the door to the libraries of Adobe and PostScript fonts! Calendar - month templates in PageStream form. Post - a full featured postscript file display and print utility.
WB75: Music - over 100 instruments files (.inst) and sample sound files (.ss) for your music programs.
WB76: Applications - This disk contains Stichery - a often requested knitting design program, Lotto - a rather complete lottery tracking and prediction utility, SSS - this screen capture program can grab almost any screen including games, Today - a personal calender, Tarot - fortune teller, and Grammar - grammar checker.
WB79: Home & Business Accounting - Includes Ckbacct - the most complete checkbook accounting program going, LCDCalc - this well done calculator has a very large display and operates from the keyboard or mouse, Mileage master - monitor your automobile mileage with this mileage log, Grammar - a grammar checker, and Worldtime - find out what time it is in up to 50 global cities.
WB81: Great Applications - DataEasy a very easy to use, database program. Don't let the ease of use fool you, this is a very full featured database program including full printer control for address labels and mail merge applications. Also includes, TypeTut a good typing tutor, RLC a full featured label printer, Banner, a multi-font banner maker, and Budget a home accounting in a program. Highly recommended.
WB82: Animations - Four full length, well done "movie" style animations. Including, Coyote, JugglerII, GhostPool, & Mechanix. 2 disks, counts as 1.
WB83: Computer Art - this disk has some of the best Amiga generated computer art that we have collected in the past 5 years.
WB85: Graphics - Contains several programs for manipulating 24 Bit color images (ham-e) and a rather nice Iff Image processing package.
WB86: Centurian Press - An electronic newspaper - requires AmigaVision.
WB88ABC: The Complete Bible - A three disk set, with the entire text of the New Testament and Old Testament-King James version. A great utility. Three disk set, counts as three.
WB90: Rippers, Strippers and Beats - For the Amiga music enthusiast, this disk contains many programs designed strip music from your favorite games and programs. Music can then be played with your favorite Pd Music program. Also contains Drums, a very nice drum machine. This disk requires some knowledge of the CLI.
WB93: Workbench Extras #2 This disk contains the utilities that Commodore should have shipped with the Amiga: VirusX4.0, Snap, FixDisk (recover corrupt/deleted files), Disk Optimizer (floppy & hard), MachIII (screen blanker, hotkey, mouse accel., macro, clock utility), GOMF (a guru-buster)and PrintStudio.
WB95: Checkbook Accountant 2.1 - This is definitely commercial grade; we've seen many checkbook programs and this is absolutely the best. Full budgeting, transaction recording and report generation.
WB96: Dupers - Contains XcopyIII & Nib which will backup copy-protected programs. FreeCopy removes copy protection from several programs, and SuperDuper will crank-out fast AmigaDOS copies.
WB98: Business - Includes BBaseII a nice, powerful database; BizCalc—a personal or mortgage loan calculator with amortization capabilities, Loop—a flowchart maker, Formmaker - design professional forms on your Epson LQ-2500 compatible printer.
WB99: Lifestyles - Includes AGene—family tree program that tracks up to 600 people/marriages/etc. Landscape is a CAD program to create gardens/landscapes. Loom simulates an 8 harness loom; experiment with pattern design in an instant feedback environment.
WB101: Chemesthetics - is a program that displays molecules as a calotte model. This kind of display contains a certain esthetic attitude, even extremely poisonous molecules like nicotine and dioxine look quite nice.
WB102: Telecommunications - Contains the programs NComm 2.0 and VT100-29B. Zmodem protocols, XPR protocol support, full VT100 emulation. NComm's script language is so powerful it comes with a script file that creates a full-featured BBS system.
WB103: Music - Contains 12 "great" Soundtracker/MED music MODules...complete with programmable/shuffle player...8 bit audio never sounded so hot! Two disk set counts as two.
WB104: GrabBag - Q&A Trivia (requires AmigaVision) is a trivia game for 1/2 players...add your own questions to customize the difficulty level! Sysinfo is great for telling you how fast/slow your computer is, what boards are installed, chipsets, etc. AmiGazer will plot stars in the heaven from any position on earth complete with magnitudes and constellation identification.
WB106: Home Manager - This is a great all-in-one address book with an autodialer/notepad/to-do list/appointment scheduler/home inventory database and phone number dialer.
WB107A&B: Educational - Drawmap is a program that generates representations such as hemispherical views, and orbital views of the Earth's surface, complete with national boundaries. Screens can be printed or saved to disk as standard IFF files. Full user-configurable online help facility. 68020+ version included. 2 disk set, counts as 1!
WB108: OctaMED - This breakthrough program doubles your Amiga's sound capabilities from 4 channels to an ear-popping 8 channels! All the renound editing capabilities of MED plus 4 more channels! If you thought your Amiga sounded good before...you aint heard nuthin' yet!

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Virus Checker - Full virus protection can be yours by simply dropping this icon in your WBStartup drawer.
Degrader - gives you tools to try to make non-2.0 happy programs work!
Icon - Enhances Workbench's "Show All" to display over 40 distinct icons for different types of files (text, IFF's, source codes, libraries, etc)
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DD45: AREXX Programs - This disk contains several useful arexx programs and examples. PopCLI4 - The latest of a must have utility.
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DD49: C Compiler - contains zc(1.01) fully K&R, zcc(1.0) front end, A68k(1.2) assembler, Blink linker.
DD50: ARexx #2 - a must have set of tutorials on ARexx and several useful examples and utilities for ARexx development.
DD51: Circuit Analysis - Aspice (2.3) A full featured program for electric circuit analysis.
DD52: Scientific - Includes Elements - an incredibly well done periodic table program with source, Scientific plotting - over 600k of Lattice C source routines that can be included in your own programs.
DD54: Compression - This disk is loaded with all of the best file compression programs and aids for the Amiga. Many of the programs can be used by the new user. Includes Arc, Lharc, Lhwarp, Pkax, PowerPacker a must have by all, Zip, Warp, and Zoo. Also IFFcrunch an excellent compression for IFF files.
DD55: ARP - On this disk you will find the complete ArpRel3.0 release including the full user docs, the full Developers guide. ARP is the official AmigaDOS Resource Project (ARP) release 1.3. ARP makes many improvements to AmigaDOS and makes your system easier to use from the CLI.
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THE LAST WORD

Kudos, complaints, comments, concerns, and contributions from our readers.

More on AmigaBasic

AmigaBasic not compatible with AmigaDOS 2.0? Tell that to my A500, which has been happily running AmigaBasic programs ever since I made the switch to 2.0. I didn't know it wasn't supposed to work until I read the letter in your May issue's Help Key. I can tell why it does work: I am still using AmigaBasic 1.2 from the disks that originally came with my Amiga. When I moved to AmigaDOS 1.3, I didn't bother to replace AmigaBasic 1.2. Since it does work, and AmigaBasic 1.3 does not, I suggest that anyone who has made the upgrade to 2.0 contact a local user's group to hunt up a copy of AmigaBasic 1.2.

Leslie S. Bird
Morrow, Georgia

Regarding J. Watson's problem with AmigaBasic being unable to run under AmigaDOS 2.04 (in Help Key, May '92), there is actually a simple way around the problem. Remember the NoFastMem utility mentioned in the manuals for the DOS 1.2 and 1.3 versions? With DOS 2.04, open the System2.0 drawer or partition, then double-click the drawer labeled SYSTEM to display the NoFastMem icon. Click on this icon so that the "Other Mem" value shown in the Workbench window title bar becomes zero. After this, AmigaBasic will run properly in AmigaDOS 2.xx. When terminating AmigaBasic, don't forget to click on the NoFastMem icon again to return "Other Mem" to its previous value.

Gene Amarante
Houston, Texas

Missing the Point

In last February's Chief Concerns, you strongly defended the Amiga's almost total lack of quality business software, saying that the computer is not an IBM clone and that it would be impossible to break into a market already so dense. The point you seem to be missing is that potential customers for business software are not only those who might buy Amigas primarily to use that software, but also the three million or so existing Amiga owners, many of whom (myself included) presumably crave a good spreadsheet. I admit the Amiga is a specialized machine, but its lack of business software is totally baffling. We've got a CPU, haven't we? So why not use it in every way possible?

Julian Coldrey
Hawker, A.C.T., Australia

CBM's Human Factor

Commodore may be lacking in its ability to market the Amiga in the US, but its employees are not lacking the high level of enthusiasm and love of the machine that have made the computer a success. We demonstrated DCTV and DeluxePaint at the 32nd annual National Art Education Association Convention in Phoenix in May, and subsequently received a very warm letter of appreciation from the Division Sales Manager, Steve Johnson.

> *Come on Commodore! Let's shake the image of the Amiga being just a toy. Promote it properly!*

We have from time to time engaged in friendly Commodore bashing, but now that we have met Steve and realize that there are talented, hard-working, intelligent people at Commodore who are just as dedicated to the Amiga as we are, the fun has fallen a little flat. Perhaps words of encouragement and positive feedback to Commodore would be more appreciated and called for.

Having owned both IBM and Macintosh hardware, we know just how truly great the Amiga is. If only software developers like Adobe, Aldus, and Microsoft would see the light and write for the Amiga platform, this memory-efficient, cost-effective, dazzlingly fast, multitasking machine would no doubt attract the numbers of users who would more than pay for the cost to develop the software.

Laurel and Tony Kashinn
Grafton, Wisconsin

Off the Ball

On last February 28, National Technological University announced its plans to broadcast a special series of programs dealing with multimedia. These live, interactive satellite broadcasts were received and viewed by hundreds of corporations, educational institutions, and government divisions across the continent. There were many speakers, including several from IBM and Apple. This was a big event.

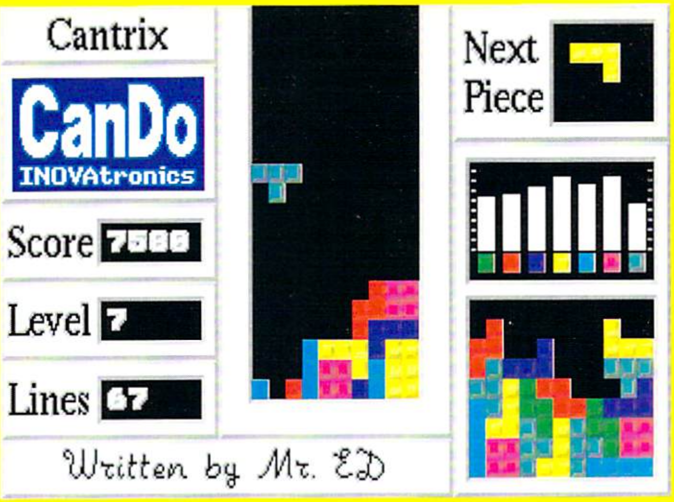
Commodore was not present.

In fact, there was no mention of the Amiga. How can Commodore afford not to participate in something like this? Come on, Commodore! Let's shake the image of the Amiga being just a toy. Let's promote it properly!

Alex Sheffield
Ottawa, Ont., Canada

The Ukrainian Connection

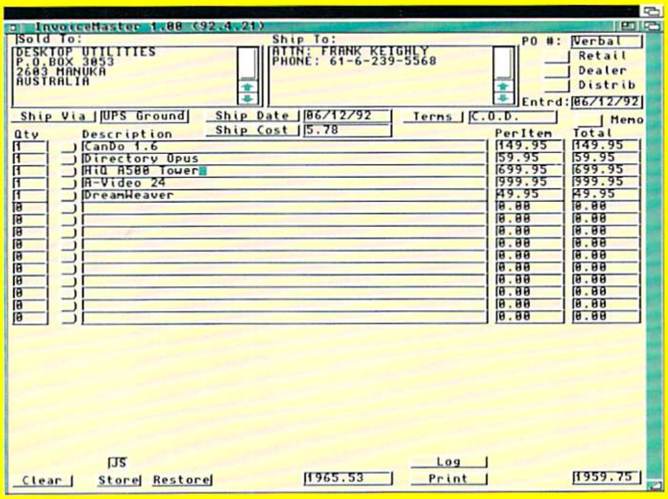
If you are interested in an Amiga-based videographics business in Ukraine, please contact Alexander V. Romanov, Dreiser St. 1/25, flat 59, Kiev-217, 253217 Ukraine; telephone (044) 5461063 (please, after 7 PM, Kiev time); FAX: (044) 2744265 (FAX must be marked "for Vasilenko-for Romanov"); E-Mail: AVR%DRP.UNIV.KIEV.UA@RELAY.USSR.EU.NET. ■



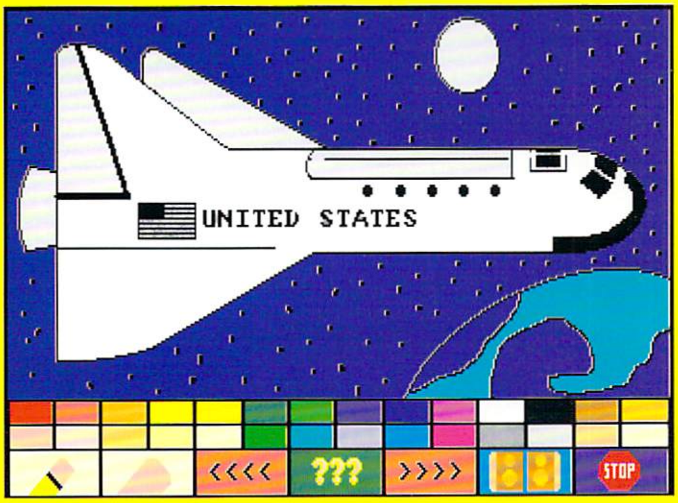
Q: What's unique about this version of this game?



Q: How do you tell the world about the Amiga possibilities in your hometown?



Q: How does a booming software company keep track of *all those invoices?*



Q: How do you keep your kids from driving you nuts on a rainy Saturday afternoon?

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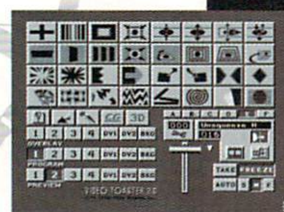


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